

FISHERIES MANAGEMENT AND EVALUATION PLAN
for the Incidental Take of Listed Species Submitted Under
ESA Section 10/4(d)

WDFW Recreational Fisheries That May Impact:

Snake River Basin Steelhead ESU
Snake River Spring/Summer Chinook ESU
Snake River Fall Chinook ESU
Snake River Sockeye ESU

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Fishery Management and Evaluation Plan - WDFW Recreational Fisheries in the Snake River Mainstem and Tributaries That May Impact Snake River Basin Steelhead, Snake River Spring/Summer Chinook, Snake River Fall Chinook, and Snake River Sockeye ESUs.

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SECTION 1 FISHERIES MANAGEMENT**1.1) General objectives of the FMEP.**

The objective of this FMEP is to describe WDFW-regulated recreational fisheries that may impact anadromous steelhead, chinook, and sockeye listed as threatened or endangered in the Washington State's portion of the Snake River Basin, the Snake River Management Area (SRMA). These fisheries may target hatchery-origin salmon and steelhead, resident trout, whitefish, and other game and food fish, and are designed and regulated to avoid jeopardizing survival and recovery of listed salmonids in the Snake River Basin Steelhead, Snake River Spring/Summer Chinook, Snake River Fall Chinook, and Snake River Sockeye ESUs.

Fisheries management objectives in this plan incorporate the general salmon and steelhead fishery management objective of the Lower Snake River Compensation Plan (LSRCP), which is to provide hatchery-origin salmon and steelhead for harvest opportunities in a manner that does not jeopardize the survival and recovery of listed steelhead or salmon in the Snake River Basin in Washington. Washington Department of Fish and Wildlife fisheries management objectives in the SRMA are to:

- ! Return adult hatchery salmon and steelhead to meet mitigation goals of the LSRCP and provide harvest opportunities. Annual mitigation goals are 18,300 fall chinook, 1,152 adult spring chinook to the Tucannon River, and 3006 returning adult steelhead to the SRMA. (1,500 to Grande Ronde, 500 Snake mainstem, 875 Tucannon, and 130 Asotin);
- ! Minimize adverse genetic or stock effects from the harvest augmentation/mitigation program on wild steelhead in the basin, or elsewhere. Maximize harvest of hatchery steelhead to minimize straying or natural spawning by hatchery produced steelhead; and

- ! Maintain recreational stream fishing opportunities for anglers to catch trout or other species. Minimize the adverse effects of these fisheries on listed wild steelhead, salmon, or bull trout and use harvest as a means to minimize the potential competition or predation effects of introduced gamefish on listed salmonids.

1.1.1) List of the “Performance Indicators” for the management objectives.

Performance indicators include fish population indicators by which the status of populations in the listed ESUs are assessed to determine trends in abundance, risk thresholds, and the impacts of management actions, including fisheries. Primary fish population indicators for listed Snake River basin salmonids are spawning escapement estimates based on dam counts or spawning area redd counts. Other population performance indicators that provide important data about salmonid populations include juvenile abundance indices from electrofishing or snorkeling, or at juvenile collection facilities; dam counts collected from all four of the lower Snake River dams; annual spawner, electrofish, and snorkel surveys conducted in the Tucannon River and Asotin Creek (other streams and drainages are surveyed on a sporadic schedule, pending funding and personnel); redd and carcass surveys conducted on the Tucannon River; juvenile collection facilities (screw traps) operated in the Tucannon and Grande Ronde rivers. Other population performance indicators include, genetic sampling for fish caught in the Grande Ronde River, Asotin Creek, and adult traps in the Tucannon River; stray rates estimated from tags or markings on fish collected in adult traps, carcass surveys, or creel surveys; and spawner to spawner survival rates for spring chinook in the Tucannon River.

Performance indicators also include fishery indicators for monitoring fishery performance and regulating impacts within prescribed limits. The primary recreational fishery indicators for Snake River basin salmonids are statistical catch and handle estimates in stratified, random, roving creel surveys conducted in the Grande Ronde River to gathering catch statistics such as the percentage of wild fish in the catch, CWT recovery, catch and handle rates for other areas of the Snake River Basin. Statistical creel surveys may also be conducted, depending on funding, as fisheries are converted or reopened for fin-clipped salmonids. Secondary fishery indicators include catch rate, fishing effort, and catch composition (size, age, mark rates, CWTs, etc.) associated with statistical creel survey and spot check programs, and annual catch record card data received from anglers. Standard creel surveys to collect CWTs and catch and handle numbers are conducted in the Tucannon and Snake rivers.

Performance Indicators

1. Benefits of the salmon and steelhead mitigation program.
 - CWT recovery to estimate numbers of hatchery fish returns and smolt to adult return rates (SARs). Also provides catch and harvest rates, locations of catch, wild fish catch, size of returning fish, sex ratios, etc.
 - steelhead catch card harvest estimates
2. Risks of the mitigation fisheries on listed salmonids and conservation of listed species
 - trout creel survey to estimate angler effort, harvest of hatchery or wild

- rainbow/steelhead, incidental catch of wild trout/steelhead juveniles
- evaluate hatchery fish straying and spawning, changes in life history or fish size or age at return, genetics, etc.
- enforcement of fishing regulations to protect listed salmon, steelhead, and bull trout.

1.1.2) Description of the relationship and consistency of harvest management with artificial propagation programs.

Hatcheries have operated in Washington for more than a century, providing fish for recreational and commercial fisheries. Hatcheries were originally built to compensate for declining wild fish populations. Later, they played a prominent role in enhancing the state's salmon resources. Now, hatcheries are an important economic force statewide and are integral to North Pacific recreational and commercial fisheries. Hatcheries also aid coast-wide management of chinook and coho by providing wild stock analogs for the CWT program. Salmon marked with CWTs are used to evaluate stock-specific fisheries harvest rates and incidental impacts on ESA-listed salmon.

Currently, WDFW operates trout and salmon hatchery facilities to provide sustainable fisheries and meet the state's tribal treaty obligations by ensuring salmon and steelhead are available for harvest. Hatcheries are also helping recover and conserve naturally-spawning salmon and steelhead populations. Both functions (providing sustainable fisheries and conserving wild stocks) represent a major realignment in hatchery operations and are occurring at the same time WDFW, the tribes, the federal government, and independent scientists are developing a comprehensive operations strategy for all hatcheries in Washington. Although trout hatchery programs operate in the region, the release of resident trout no longer occurs in anadromous zones of the SRMA.

Artificial production of salmonids in the SRMA is based on mitigation due to the lost of salmon and steelhead caused by the construction and operation of the four lower Snake River dams and navigation lock projects. Production levels are based on the number of juvenile fish needed to compensate for losses of adult salmon and steelhead. A joint United States Fish and Wildlife Service (FWS)/NMFS Coordination Act Report was provided to the Army Corps of Engineers (Corps) in 1972 which described the short and long term impacts of all four Lower Snake dams and recommended mitigation and compensation for both fish and wildlife. The report provided the basis for the Corps' 1975 Lower Snake River Fish and Wildlife Compensation Plan (LSRCP) to Congress. A year later the LSRCP was authorized by Congress as part of the Water Resources Development Act of 1976 (90 Stat. 2917).

The LSRCP program has been operated since 1983 to provide mitigation for harvest opportunities, adult salmon and steelhead lost because of the construction of the four lower Snake River dams. The program has used Wells, Lyons Ferry Hatchery (LFH), and Wallowa stock steelhead since the 1980s to augment depressed steelhead stocks in the SRMA. The most recent Biological Opinion by NMFS (NMFS 1999) considered the release of the LSRCP-produced hatchery steelhead to constitute jeopardy for the listed steelhead populations within the Snake

River. An indigenous stock of Tucannon River steelhead is being developed, in part, as a result of the Reasonable and Prudent Alternatives discussed in the NMFS' Biological Opinion (NMFS 1999).

It was the conclusion of that Biological Opinion that artificial propagation for spring/summer and fall chinook in the Snake River basin will not likely jeopardize the continued existence of these listed stocks. The take of listed fish species that may occur as a result of the release of hatchery spring chinook into the Tucannon River from the Tucannon River hatchery is authorized by the NMFS via the ESA Section 10 permit # 1129, and the program is operated by WDFW to benefit listed stocks.

A hatchery stock developed from the indigenous Tucannon River steelhead for mitigation production will not increase overall natural productivity, but can serve several purposes.

- ! Hatchery production can attempt to maintain or increase numbers of naturally reproducing Tucannon River steelhead in under-utilized spawning and rearing habitat. Efforts within this ESU intend to reduce the short term extinction risk to the existing wild population and to increase the likelihood of their recovery to a healthy status. These objectives may be accomplished through the establishment of a supplemented population using indigenous broodstock.
- ! Minimize the potential for genetic introgression and depression that may occur with continued use of the existing hatchery stock. Allozyme and DNA data collected by WDFW indicate that despite large releases of hatchery fish for three generations, little introgression by the hatchery stock into the indigenous population has occurred. Thus, interbreeding among hatchery and natural fish may be reducing productivity and fitness within the natural population.
- ! Speed recovery of Tucannon River steelhead once natural productivity has reached or exceeded replacement as a result of habitat improvements within the basin.
- ! Provide mitigation production under LSRCP while complying with NMFS's Reasonable and Prudent actions as listed in their Biological Opinion (NMFS 1999). Washington Department of Fish and Wildlife desires to maintain healthy, abundant populations of steelhead within the Snake River, but also wants to provide abundant fishery opportunities as provided for under the LSRCP mitigation program.
- ! Potentially reduce the incidence of straying within the SRMA. Hatchery fish from the LFH program have been shown to stray into other basin rivers of the Columbia River. Although this program will consist of hatchery fish, straying may be reduced because the new hatchery stock will be developed from the indigenous population, which may stray to a lesser extent. Mitigation goals will be fully integrated as conservation and recovery goals are achieved.

Wallowa stock steelhead have been released by the LSRCP programs in the Grande Ronde River, Asotin Creek and the Tucannon River. LFH stock steelhead are released in the Snake River near Lyons Ferry Hatchery and in the Tucannon River. A recent Biological Opinion from NMFS (NMFS 1999) considered the release of these stocks to constitute jeopardy for the listed

populations within the SRMA, as well as in the Deschutes River (Wallowa stock) in the Mid-Columbia Basin. Numbers of fish released in the Grande Ronde have been reduced to minimize adverse effects of this inappropriate stock on listed fish and because the hatchery program in the Grande Ronde is exceeding adult return hatchery mitigation goals. Wallowa stock steelhead are no longer released in Asotin Creek, the Tucannon River or in the Snake River near Asotin Creek. The numbers of LFH stock released in the Snake and Tucannon rivers have been reduced. A local broodstock is being developed in the Tucannon River. Natural population genetic sampling is ongoing to help determine the number of stocks and appropriate development of endemic broodstocks for the lower Grande Ronde and to develop a better understanding of stock status in the Tucannon River.

All hatchery steelhead released in SRMA are externally marked with adipose fin clips and some with adipose clips and left ventral fin clips. These external marks allow easy and quick identification between hatchery-origin and wild-origin steelhead. Externally marking all hatchery released steelhead allows the WDFW to implement selective steelhead fisheries that targets hatchery-origin steelhead only. Steelhead fisheries managed by WDFW in the SRMA are wild steelhead release fisheries. Steelhead-targeted fisheries are also concentrated near hatchery release locations where returning hatchery adult steelhead concentrate prior to spawning.

Artificial production of spring/summer and fall chinook is also funded and managed under the LSRCP. Washington Department of Fish and Wildlife uses LSRCP funds at the Lyons Ferry Hatchery complex to produce spring/summer and fall chinook in the Snake River basin. The spring chinook program in the Tucannon River was initially a standard supplementation program using local stock, but it has added a temporary captive brood program to try and maintain and restore the endemic population. The fall chinook program in the Snake River consisted of an egg bank program to preserve and increase the population of indigenous Snake River fall chinook. This program continues to be an egg bank program and is now being used to supplement the population in the basin and to contribute to recovery under the ESA.

All spring/summer and fall chinook released from WDFW hatchery programs are externally marked with fin clips, enabling WDFW to manage a selective fishery directed at hatchery-origin fish. Washington Department of Fish and Wildlife currently does not implement fisheries targeting Snake River fall chinook or sockeye because directed fisheries may cause adverse impacts to the wild fish in these stocks. Washington Department of Fish and Wildlife will consider directed fisheries at hatchery-origin fall chinook in the future if hatchery surpluses are available and wild stocks are determined to be resilient to directed fisheries. Spring chinook fisheries will be managed as a selective harvest fisheries directed at hatchery-origin chinook. They will be scheduled during the peak of hatchery run times and concentrated near release locations and hatchery facilities. All spring chinook fisheries will be managed with wild chinook release requirements.

The Tucannon River HGMP and Lyons Ferry Hatchery Annual Operations Plan provides more detailed descriptions of the artificial production programs in the SRMA.

Hatchery operations in the SRMA include LSRCP goals and local objectives. The hatchery program no longer releases resident rainbow trout into anadromous waters. Hatchery salmon and steelhead are released downstream of primary natural production areas, increasing spacial and temporal separation. Fisheries for hatchery-origin salmon and steelhead are scheduled during hatchery run timings and occur in hatchery release areas. All hatchery steelhead and chinook are externally marked with adipose fin clips and some steelhead have left ventral fin clips and CWT. All hatchery chinook, both spring/summer and falls, and a selection of hatchery steelhead have CWTs inserted prior to release. Smolt to Adult Return Rates (SAR) are determined to aid in monitoring mitigation measures of the LSRCP.

1.1.3) General description of the relationship between the FMEP objectives and Federal tribal trust obligations. (This will be further addressed in section 4)

Federal court decisions (U.S. vs. Oregon, 1969 and U.S. vs. Washington, The Bolt Decision, 1974) have ruled that Indian tribes who signed treaties with the federal government in the 1850s have treaty fishing rights to harvest a share (50%) of surplus fish resources in their usual and accustom fishing grounds in the Columbia River basin and other Washington waters. These court decisions mandated fisheries management cooperatively in a government-to-government relationship between Washington State and the treaty Indian tribes. These decisions also mandate state hatchery facilities to produce fish for harvest proposes.

Washington's salmon and steelhead fisheries are managed cooperatively in a government-to-government relationship between Washington State and Washington's treaty Indian tribes. Treaty Indian fisheries may be conducted in the Snake River watershed. These fisheries are not regulated by WDFW and are conducted as ceremonial and subsistence fisheries. Tribal commercial fisheries have not occurred in recent history in the SRMA and are not planned in the near future (WDFW 2000). Each tribe regulates its fisheries and issues fishery regulations through its governing bodies. The tribes are represented by their staff on the Columbia River Fisheries Management Plan (CRFMP) Technical Advisory Committee and participate in monitoring activities and data sharing with other parties. The tribes have policy representation in the U.S. v. Oregon harvest management processes and generally coordinate fisheries with the Columbia River Compact as necessary.

Ocean recreational, commercial, and treaty tribal salmon fishery regulations are adopted through the Pacific Fisheries Management Council process, see 1.5.

1.2) Fishery management area(s).

1.2.1) Description of the geographic boundaries of the management areas of this FMEP.

This plan discusses and evaluates the recreational fisheries in the anadromous portions of the Snake River mainstem, from the mouth upstream to the Washington-Oregon border. This plan includes the fisheries conducted in anadromous portions of Snake River and its tributaries,

including the Tucannon River, Asotin Creek, and the Grande Ronde River and their tributaries, within the State of Washington only (Figure 1).

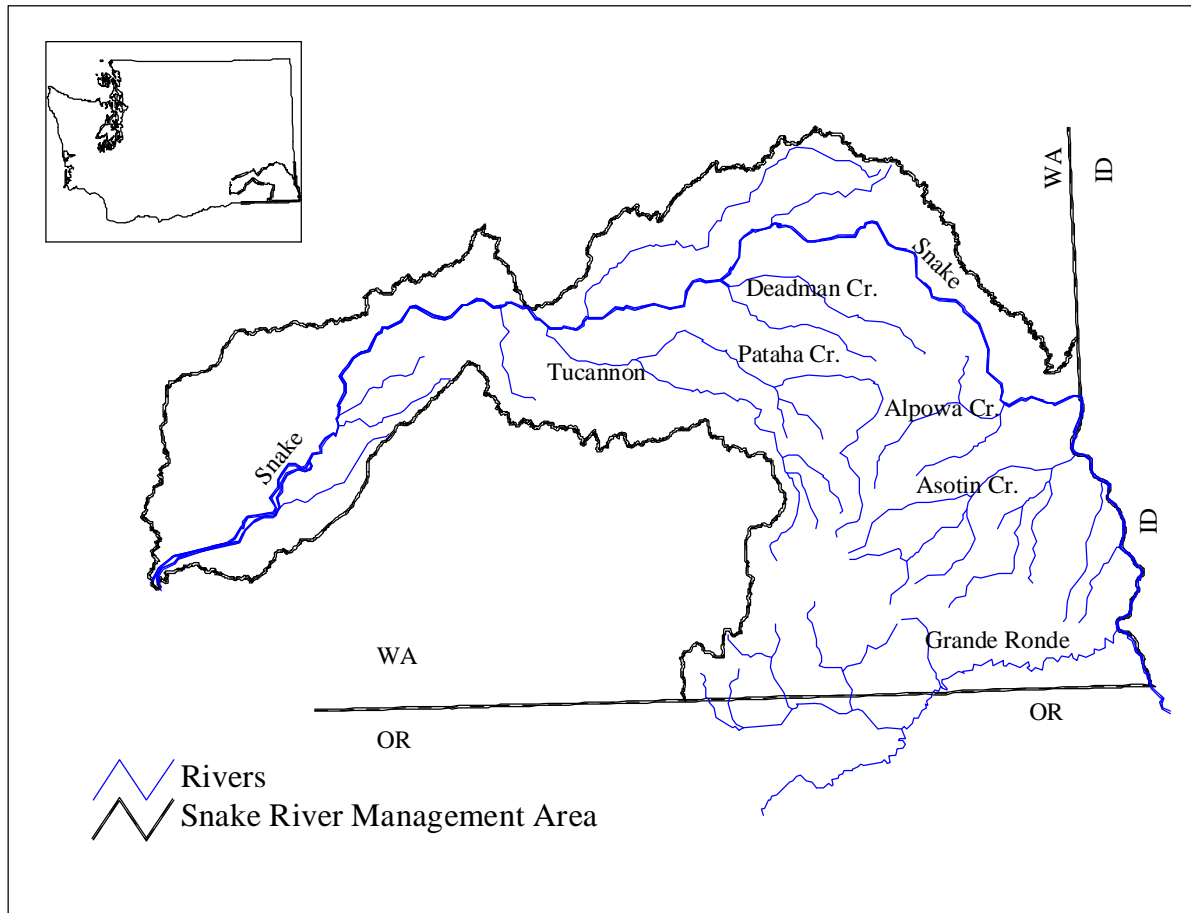


Figure 1. The Snake River Management Area.

1.2.2) Description of the time periods in which fisheries occur within the management areas.

Fisheries in the Snake River and its tributaries may occur year-round. Recreational fisheries include targeted hatchery-origin salmon and steelhead, trout, sturgeon, whitefish, and warmwater fisheries. Most harvest impacts to listed species occur in the targeted fishery and few impacts occur in non-targeted fisheries. Salmon fisheries are closed year-round unless specifically listed as open. Spring chinook fisheries, which had been closed from 1977 to 2000 in the SRMA, except for periodic “jack” (chinook between 12 and 24 inches, coho between 12 and 20 inches returning to spawn) salmon fisheries, may commence soon after hatchery fish enter the Snake River mainstem in April and would continue through June or early July, closing thereafter, to protect spawners and migrating adult Snake River sockeye. Fisheries directed at hatchery-origin fall

chinook may occur when hatchery fish are in the river, from August through November. Fisheries directed at hatchery-origin steelhead commence in September and continue through March or mid-April. Closing these fisheries by mid-April protects steelhead spawning populations and outmigrating juvenile salmonids.

Fisheries in the SRMA occur for other unlisted fish including trout, whitefish, sturgeon, and warmwater fish. The general fishing season for resident species, as with statewide rules, opens on June 1 and continues through October, however, many tributaries in the SRMA remain open through March or mid-April to provide harvest opportunity for winter resident steelhead and other winter angling opportunities. The Snake River mainstem general fishing season opening is delayed until mid-June providing extra time for juvenile salmonids to outmigrate. Fisheries are closed in the SRMA in April or May to protect spawners and smolts. Other game fish and sturgeon fisheries are open year-round in the mainstem Snake River.

A frame work for sport fishing rules in SRMA are included in **Appendix A General Regulation Framework for Snake River Mainstem and Tributary Fisheries.**

1.3) Listed salmon and steelhead affected within the Fishery Management Area specified in section 1.2.

Snake River Basin Steelhead ESU, which includes all naturally-spawned populations of anadromous steelhead (and their progeny) residing below long-term, natural and man-made impassable barriers (i.e., dams) in rivers and streams flowing into the Snake River basin. Snake River basin steelhead occupy most major and some minor tributaries of the SRMA.

The Washington Department of Fish and Wildlife Salmon and Steelhead Stock Inventory (SASSI) (WDF/WDW 1993) identify three populations of summer steelhead in the SRMA. A fourth stock is proposed for recognition as a SASSI stock, pending co-manager approval, and includes the spawning steelhead populations in the Snake River mainstem and several small tributaries. The status of this stock is not currently known. The Tucannon River, Asotin Creek, and Grande Ronde River contain independent steelhead stocks based on geographical isolation. The three SASSI stocks were classified as depressed based on chronically low spawner escapement and mortalities associated with the passage of four Columbia River dams and four Snake River dams. Hatchery steelhead have been introduced into each of these populations and may also contribute to the depressed status. Hatchery fish from the Lyons Ferry and Tucannon hatcheries have historically been released into the Tucannon River and Asotin Creek, and LFH fish of Wallowa stock are released into the Grande Ronde. In part, as a result of terms and conditions of the NMFS Biological Opinion (1999), an indigenous Tucannon River steelhead broodstock is currently in development and will be used in supplementation and augmentation programs in the Tucannon to assist in recovering this population. Hatchery releases were discontinued in Asotin Creek in 1986, however, hatchery strays are documented in this drainage. The majority of natural production habitat in the Grande Ronde basin is located in Oregon, but several small tributaries in Washington produce steelhead. Spawner escapement estimates are not made by WDFW for this

drainage.

Snake River Spring/Summer Chinook ESU, which includes all naturally-spawned populations of spring/summer chinook salmon in the mainstem Snake River and any of the following subbasins: Tucannon River, Grande Ronde River, Imnaha River, and Salmon River. Snake River spring and summer chinook historically spawned in virtually all accessible and suitable habitat within the basin (NMFS 1995). The SASSI recognized only two stocks of spring chinook in the SRMA, the Tucannon River stock and the Asotin Creek stock. Although other populations of spring and summer chinook spawn in Washington's portion of the basin (eg. Grande Ronde tributaries), they were not recognized as individual stocks. The native Asotin Creek stock has been extirpated in the past ten years (Glen Mendel pers. comm.). The Tucannon River spring chinook status is critical based on chronically low escapement and mortalities associated with the passage of four Columbia River dams and the two lower Snake River dams. Spring/summer chinook in the Grande Ronde drainage are not considered a Washington State stock, because most of the suitable spawning habitat is located in the Oregon portion of the basin. Snake River spring/summer chinook use the Snake River mainstem in the SRMA as a migration corridor. All hatchery production of spring/summer chinook in the SRMA is associated with mitigation from the LSRCP. An indigenous stock of Tucannon spring chinook is used for broodstock for supplementation and augmentation purposed (NMFS ESA Section 10 permit # 1129, July 25, 2000).

Snake River Fall Chinook ESU, which includes all naturally-spawned populations of fall chinook salmon in the mainstem Snake River and any of the following subbasins: Tucannon River, Grande Ronde River, Imnaha River, Salmon River, and Clearwater River. SASSI recognizes one stock of fall chinook that spawn in Washington's portion of the Snake River. This stock includes spawning populations in the mainstem Snake River and in Tucannon and Grande Ronde rivers. The population is classified as depressed, however, more recent escapement estimates (past four years) have shown an increase in numbers. Recent escapement estimates are still considerably lower than historic levels. Hatchery fall chinook from the Lyons Ferry hatchery are released annually into the SRMA. Fall chinook hatchery programs are expected to improve adult to adult survival of the Snake River Fall chinook (NMFS 1999).

Snake River Sockeye ESU, which includes all naturally-spawned populations of sockeye salmon in the Salmon River subbasin. These fish currently originate from Redfish Lake and other nearby lakes in Idaho. There are no distinct spawning populations of Snake River Sockeye in Washington's portion of the Snake River. Snake River sockeye use the Washington portion of the Snake River as a migration corridor.

The Columbia River basin bull trout (*S. confluentus*) were listed as threatened on June 10, 1998 (63 FR 31647) and are present in the Snake River Management Area. USFWS published an ESA section 4(d) rule finding that Washington State angling regulations are adequate to provide continued conservation benefits for the bull trout, and allows angling in the Columbia and Snake river Basins under existing State regulations (64 FR 58910).

1.3.1) Description of “critical” and “viable” thresholds for each population (or management unit) consistent with the concepts in the technical document “Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units.”

NMFS defines population performance in terms of abundance, productivity, spatial structure, and diversity and provides guidelines for each (McElhany et al. 2000). NMFS identifies abundance guidelines for critical and viable population thresholds. Critical thresholds are those below which populations are at relatively high risk of extinction. Critical population size guidelines are reached if a population is low enough to be subject to risks from: 1) compensatory processes, 2) genetic effects of inbreeding depression or fixation of deleterious mutations, 3) demographic stochasticity, or 4) uncertainty in status evaluations. If a population meets one critical threshold, it would be considered to be at a critically low level. Viability thresholds are those above which populations have negligible risk of extinction due to local factors. Viable population size guidelines are reached when a population is large enough to: 1) survive normal environmental variation, 2) allow compensatory processes to provide resilience to perturbation, 3) maintain genetic diversity, 4) provide important ecological functions, and 5) not risk effects of uncertainty in status evaluations. A population must meet all viability population guidelines to be considered viable.

Productivity or population growth rate guidelines are reached when a population’s productivity is such that: 1) abundance can be maintained above the viable level, 2) viability is independent of hatchery subsidy, 3) viability is maintained even during poor ocean conditions, 4) declines in abundance are not sustained, 5) life history traits are not in flux, and 6) conclusions are independent of uncertainty in parameter estimates. Spatial structure guidelines are reached when: 1) number of habitat patches is stable or increasing, 2) stray rates are stable, 3) marginally suitable habitat patches are preserved, 4) refuge source populations are preserved, and 5) uncertainty is taken into account. Diversity guidelines are reached when: 1) variation in life history, morphological, and genetic traits is maintained, 2) natural dispersal processes are maintained, 3) ecological variation is maintained, and 4) effects of uncertainty are considered.

This fishery management plan focuses primarily on abundance and productivity which are the two key performance features most directly affected by fishery impacts at the scale estimated. Spatial structure is generally a function of habitat size and distribution. The fisheries discussed in this plan do not affect habitat. The small fishery impact rates estimated to occur also will not reduce population sizes to levels where spatial effects are exacerbated. Diversity concerns for listed Snake River fish are primarily related to the effects of natural spawning by hatchery fish and their effects to the biological characteristics of each stock. The small fishery impact rates estimated to occur on wild fish are not expected to exert sufficient selection pressure on any single characteristic to affect diversity. Section 2.1.2 provides a more detailed discussion of why the harvest regime is not likely to result in changes to biological characteristics of the affected ESUs.

The NMFS VSP document provides limited guidance on fish numbers corresponding to critical

and viability thresholds. They discuss hypothetical risks related to genetic processes effective at annual spawning population ranging from 50 to several thousand individuals. The NMFS' Viable Salmonid Populations guidelines include multiple cautions about the effects of uncertainty in population assessments and also recommend an adaptive management approach for reducing uncertainty (McElhany et al. 2000). The variability in population thresholds discussed in McElhany et al. (2000) brings about confusion when attempting to address the viable and critical population threshold issue. As the NMFS' Technical Review Team (TRT) is given the responsibility to develop these number, WDFW is to assist the TRT with the development of the critical and viable population thresholds.

Definition of an appropriate viability threshold depends largely on the capacity and productivity of the available habitat and the corresponding population size where compensatory population processes begin to provide resilience. Habitat capacity and productivity for wild Snake River steelhead, Tucannon spring/summer chinook and Snake River fall chinook salmon under current conditions are unknown. It is difficult to determine how large a population must be in the basin to be resilient against any compensatory process without high quality long-term data on population abundance and productivity. Washington Department of Fish and Wildlife lacks this type of information in the tributaries within this management plan. Washington Department of Fish and Wildlife also lacks the data needed to evaluate habitat productivity and capacity in the tributaries with regulated fisheries. These conditions are unknown for most wild salmon and steelhead stocks. Changes in hatchery practices and the institution of appropriate monitoring programs will provide the necessary information in the future but preliminary estimates of productivity and capacity will require a number of years of age-specific escapement data in addition to the data already collected.

SASSI defines an individual stock as fish spawning in a particular lake or stream(s) at a particular season, which to a substantial degree do not interbreed with any group spawning in a different place, or in the same place at a different season. Although this may be a reliable definition of a stock, some SASSI stocks are inherently too small to be genetically viable due to habitat availability or capacity or they may be subpopulations of a larger population. In addressing the critical population issue, some SASSI stocks may need to be classified into subpopulations of a larger population based on geographic location and spawn timing of each subpopulation. Table 1 illustrates the SASSI stocks present in the SRMA. The Snake River Tributary summer steelhead is a proposed SASSI stock pending co-manager approval.

Table 1. List of the management units, natural populations, “Critical” and “Viable” thresholds, and associated hatchery stocks included in this FMEP (WDF/WDW 1993, G. Mendel WDFW).

SASSI populations of listed salmon and steelhead stocks	Associated hatchery stock(s) ¹	Escapement/Mgmt. Goal ²	Most recent 5-year average escapement estimates	WDFW SASSI status	Viable Pop. ³	Critical Pop. ³
Tucannon Summer Steelhead	Indigenous Tucannon/LFH	600 875 ⁴	452	Depressed	N/A	N/A
Asotin Creek Summer Steelhead	None	160 130 ⁴	264	Depressed	N/A	N/A
Grande Ronde Summer Steelhead	Wallowa hatchery stock	1,500 ⁴	N/A	Depressed	N/A	N/A
Snake River Trib. Summer Steelhead	LFH, Wallowa hatchery stock	500 ⁴	N/A	Unknown	N/A	N/A
Tucannon Spring Chinook	Indigenous Tucannon	1,152 ⁴	208	Depressed	N/A	N/A
Asotin Creek Spring Chinook	None	N/A	Believe to be extinct.	Critical	N/A	N/A
Snake River Fall Chinook	LFH	2,500 ⁵ 18,300 ⁴	2,327	Depressed	N/A	N/A
Snake River Sockeye	N/A	N/A	N/A	N/A	N/A	N/A

¹ None of the hatchery stocks release into the SRMA are essential to the recovery of the associated ESU.

² Escapement goals for steelhead stocks are outdated and were set during moderate to high ocean productivity. At this time, sufficient data have not been gathered to accurately update these numbers.

³ Critical and viable populations will be developed by Technical Review Teams and will be implemented into the FMEP when their analyses are completed and provided to WDFW.

⁴ Lower Snake River Compensation Plan adult hatchery return goals.

⁵ National Marine Fisheries Service draft recovery plan goal, (1995) as counted at Lower Granite Dam.

1.3.2) Description of the current status of each population (or management unit) relative to its “Viable Salmonid Population thresholds” described above. Include abundance and/or escapement estimates for as many years as possible.

Tucannon River Summer Steelhead were classified as depressed by WDFW because of chronically low escapement (WDF/WDW 1993). The population is likely at a “critical” population threshold because it is chronically depressed and at low levels for wild fish (Table 2). Escapements of natural spawning steelhead into the Tucannon River, Pataha Creek, and tributaries have been made by WDFW since 1987. Escapement numbers have decreased steadily since 1990; the spawning population was estimated at just 71 individuals in 1996. Stochastic events pose significant genetic risk to the population because of low absolute population numbers.

Juvenile and adult survival of summer steelhead emigrating from and returning to the Tucannon River is compromised by two Lower Snake River dams and four Columbia River dams. Mortality

associated with these structures and their reservoirs is a major factor in keeping escapement below goal. Without improvements to passage survival at the dams, it is unlikely that significant increases in the wild population will occur.

Table 2. Summer steelhead historical escapement in portions of the Tucannon River and Asotin Creek (J. Bumgarner, WDFW).

Year	Tucannon				Asotin
	Wild	Hatchery	Total	Sport Catch	Total
1986	Data are not available for this year.				754
1987	521	750	1,271	180	454
1988	525	787	1,312	255	325
1989	319	388	707	310	750
1990	416	343	759	337	N/A
1991	210	256	466	320	750
1992	166	513	679	358	116
1993	94	475	569	159	99
1994	151	96	247	164	148
1995	147	230	377	580	256
1996	71	322	393	842	NA
1997	Data are not available for this year.				NA
1998	Data are not available for this year.				122
1999	85	340	425	N/A	332
2000	N/A	N/A	537	N/A	337

Estimated natural escapement into the Tucannon River is believed to be below replacement in most run years, thus contributing to the decline of the population within the basin and within the ESU. Recent and historical performance of hatchery-reared steelhead in the Tucannon has shown the program capable of returning adults above the replacement line. Washington Department of Fish and Wildlife expects survival of the endemic brood hatchery-reared fish to equal or exceed survival rates for its long-term hatchery stock. Early-rearing survivals (egg to pre-smolt) within the hatchery will far exceed those observed in the Tucannon wild population. Fish returning from hatchery production of endemic brood will be allowed to spawn in the wild and contribute to filling available habitat and increasing the number of naturally-produced fish spawning in the wild one generation later. Spawner-to-spawner survival is expected to increase because of the broodstock program, but spawner-to-spawner survival of subsequent natural populations will be dependent upon improvements in basin productivity and migratory corridor survivals. The two most recent years, 1999 and 2000, shows slight increases in adult returns to the Tucannon basin.

Asotin Creek Summer Steelhead were classified as depressed by WDFW because of chronically low escapement (WDF/WDW 1993). The population may not be at a viable threshold because of chronically low escapement. Escapements of wild steelhead steelhead into Asotin Creek and its tributaries have been estimated by WDFW since 1986.

Juvenile and adult survival of summer steelhead emigrating from and returning to Asotin Creek is compromised by four Lower Snake River dams and four Columbia River dams. Mortality associated with these structures and their reservoirs is a major factor in keeping escapement below goal. Without improvements to passage survival at the dams, it is unlikely that significant increases in the wild population will occur, although, run size in the past two years, 1999 and 2000, have shown a slight improvement.

Grande Ronde River Summer Steelhead were classified as depressed by WDFW because of chronically low escapement (WDF/WDW 1993). Estimates of natural steelhead escapement into the Grande Ronde River and its tributaries are not well documented. Escapement estimate surveys are not conducted by WDFW, while Oregon Department of Fish and Wildlife (ODFW) conducts redd-count surveys in index streams. These numbers are not extrapolated to total escapement for the basin. The long-term trend of the Grande Ronde summer steelhead population is stable (T. Walters, ODFW, pers. comm. February 5, 2001) but smaller than during the per-dam era.

Survival of juvenile and adult summer steelhead emigrating from and returning to the Grande Ronde River basin is compromised by four Lower Snake River dams and four Columbia River dams. Mortality associated with these structures and associated reservoirs is a major factor in keeping escapement lower than potential productivity. Without improvements to passage survival at the dams, it is unlikely that significant increases in the wild population will occur.

Snake River Tributary Summer Steelhead is a proposed SASSI stock pending co-manager approval. It was proposed as an independent stock by local biologists in January 2001 (G. Mendel, WDFW, pers. comm. 2001). Populations of this stock spawn in the Snake River mainstem and many minor tributaries within Washington (eg. Couse, Tenmile, Alpowa, Almota, Deadman creeks, etc.), and does not conform geographically with other established SASSI stocks. Evaluation of this stock and its spawning populations has been initiated. The status of these populations is unknown.

Tucannon River Spring Chinook were classified as depressed by WDFW because of chronically low escapement (WDF/WDW 1993). The population is likely at a “critical” population threshold because it is chronically depressed and the population has declined abruptly since 1993 (Figure 2). Escapement has been as low as 54 fish in the past six years and wild fish returns are below replacement nearly every year. Stochastic events pose significant genetic risk to the population because of low absolute population numbers.

Survival of juvenile and adult spring chinook emigrating from and returning to the Tucannon River is compromised by two Lower Snake River dams and four Columbia River dams. Mortality associated with these structures and their reservoirs is a major factor in keeping escapement below goal. Without improvements to passage survival at the dams, it is unlikely that significant increases in the wild population will occur.

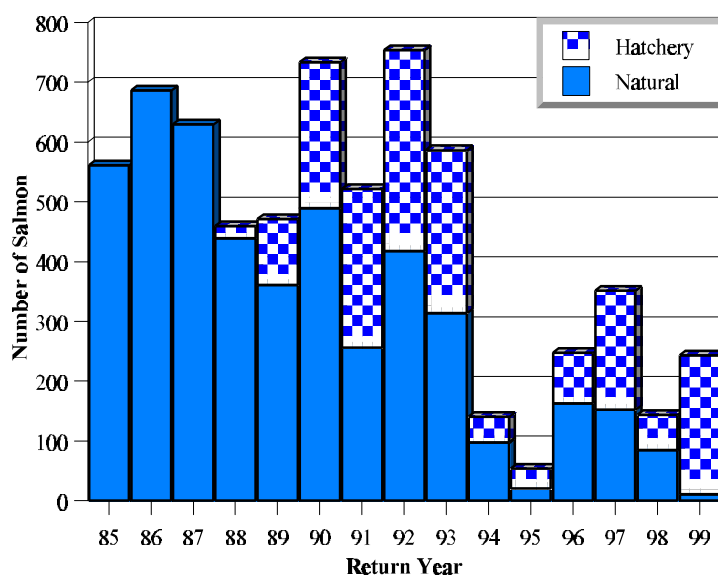


Figure 2. Tucannon River spring chinook escapement estimates and population composition (J. Bumgarner, WDFW).

Asotin Creek Spring Chinook were classified as critical by WDFW because of chronically low escapement (WDF/WDW 1993). Escapements wild chinook in Asotin Creek and its tributaries have been estimated by WDFW since 1986 (Table 3). This population is believed to have been extirpated within the past 10 years.

Survival of juvenile and adult spring chinook emigrating from and returning to Asotin Creek is compromised by four Lower Snake River dams and four Columbia River dams. Mortality associated with these structures and their reservoirs is a major factor in the extirpation of this run. Without improvements to passage survival at the dams, it is unlikely that a successful reintroduction program will occur, or the wild population would increase significantly. Strays from the Snake River mainstem, other local populations, and hatchery fish may currently enter and spawn in Asotin Creek.

Table 3. Number of spring chinook salmon redds, live fish, and carcasses observed on the North Fork Asotin Creek from 1984-2000 (G. Mendel, WDFW).

Year	Number of Redds	Number of Live Fish	Carcasses
1984	21	12	5
1985	8	7	1
1986	1	3	0
1987	3	6	0
1988	1	0	0
1989	0	0	0
1990	2	0	0
1991	0	0	0
1992	0	0	0
1993	2	0	1
1994	0	0	0
1995	0	0	0
1996	0	0	0
1997	1	0	0
1998	0	0	0
1999	0	0	0
2000	1	0	0

Snake River Fall Chinook were classified as depressed by WDFW because of chronically low escapement (WDF/WDW 1993). Escapements of wild adult fall chinook have been monitored by WDFW since 1975 using fish counts from the Lower Granite Dam. Counts have been fewer than 1,000 annually for most years since 1975, down from a historically large average run of 72,000 fall chinook in 1957-60 (Irving and Bjornn 1981). Most recent escapements have indicated a increase in returning adult fall chinook (Figure 3). This is mainly due to increased releases of hatchery fish above Lower Granite Dam.

Survival of juvenile and adult fall chinook emigrating from and returning to the Snake River is compromised by four Lower Snake River dams and four Columbia River dams. In addition, Brownlee, Oxbow, and Hells Canyon dams block passage to the upper river, and flooded spawning reaches. Mortality associated with dams and their reservoirs is a major factor in keeping escapement below goal. Down river and ocean harvest was historically very significant. Harvest rates have been substantially reduced in recent years. Without improvements to passage survival at the lower Snake and Columbia river dams, it is unlikely that significant increases in the

wild population will occur.

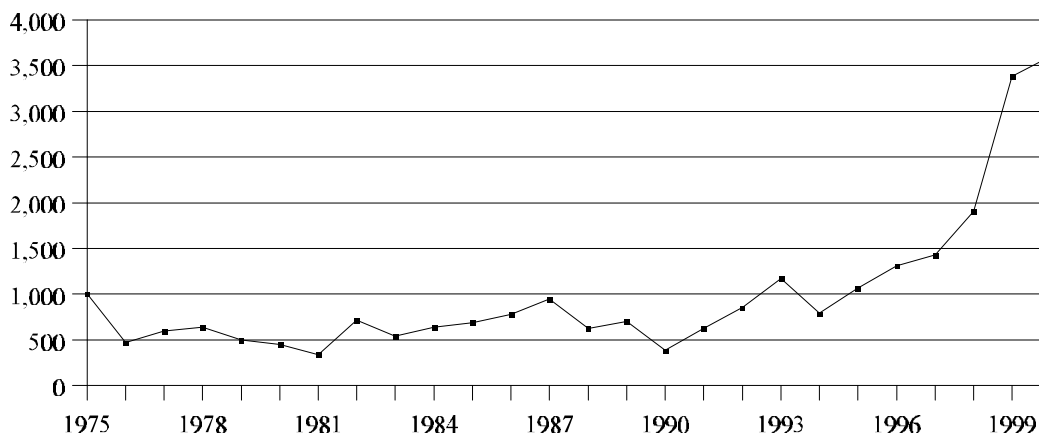


Figure 3. Snake River fall chinook adult counts at the Lower Granite Dam, 1975 to 2000 (ODFW/WDFW 2000a).

Natural fall chinook spawning now occurs primarily in the Snake River from Hells Canyon Dam to Asotin and in the lower reaches of the Clearwater, Grande Ronde, Salmon, Tucannon and Imnaha rivers. A small amount of spawning occurs immediately below the lower Snake River dams.

Snake River Sockeye were classified as Endangered in 1991.

Current production is limited to Redfish Lake and Alturas Lake in the Salmon River Basin in Idaho. Snake River sockeye use the Washington portion of the Snake River as a migration corridor only. Mortality associated with the Snake River dams and their reservoirs is a major factor in the population problems facing the Snake River sockeye.

1.4) Harvest Regime

Harvest management by WDFW is a collection of data from stream and harvest surveys; computer modeling; coordination between tribal co-managers, other governments, and public input; and mitigation and litigation objectives. Implementing these processes provides WDFW with the ability to craft fishing seasons that protect weak wild fish populations while providing harvest opportunities on plentiful hatchery stocks.

All harvest of listed salmon and steelhead in the SRMA is the result of indirect harvest. Indirect harvest occurs when listed fish are incidentally caught and released during recreational fisheries. All WDFW-managed salmon and steelhead fisheries in the SRMA are recreational selective fisheries, targeting hatchery-origin fish. Indirect harvest may also occur during recreational fisheries directed at other species, such as resident trout and warm water fisheries.

Salmon-directed fisheries have not been implemented by WDFW in the SRMA from 1977 to 2000 except for a three month fall chinook fishery and fisheries targeting jack salmon from 1988 to 1993. A spring chinook fishery directed at jack salmon continued in the Tucannon River until 1983. Mass marking of hatchery salmon released by WDFW in the Snake River basin has been ongoing since 1990. This provides opportunities for recreational selective fisheries, targeting hatchery-origin fish, when populations are large enough to support incidental fishery impacts. Selective fisheries directed at hatchery-origin fish will be implemented when salmon populations in the Snake River basin are at adequate levels.

S Snake River salmon populations prior to 2001 were at levels that WDFW believed adverse impacts to wild populations may have occurred if fisheries directed at salmon were implemented. Improvements in Snake River salmon population numbers prompted WDFW to implement a fisheries directed at hatchery-origin spring chinook. Mass marking programs allow WDFW to implement selective salmon fisheries directed at hatchery-origin fish, reducing the potential impacts to wild fish that may occur during a directed fishery. Catch of hatchery salmon and interception of wild salmon will be monitor WDFW during fisheries directed at hatchery-origin salmon. As the Snake River chinook populations remain at levels above which WDFW determines that salmon-directed fisheries will not cause adverse impacts to wild runs, WDFW will consider implementing salmon fisheries directed at hatchery-origin fish. Fisheries implementation requires the cooperation of Treaty Tribe, local, and federal governments. Strong salmon runs will not automatically lead to the implementation of salmon fisheries directed at hatchery-origin fish. WDFW will implement salmon fisheries directed at hatchery-origin fish when coordination and cooperation is achieved and projected salmon runs are sufficient to support these fisheries.

The state of Washington has implemented spring chinook recreational fisheries in the Snake River basin. Fisheries are selectively targeting hatchery-origin fish and requires the release of wild spring chinook. The time frame of the fisheries is the month of May, which coincide with peak migration of hatchery fish from local and upstream hatcheries, but could continue into early June if impacts remain below projected levels. Impacts to listed Snake River spring chinook will occur from hook and release and associated handling mortality of incidentally caught fish.

This FMEP focuses primarily on fisheries targeting hatchery-origin salmon and steelhead where most fishery impacts to listed species occur. Most hatchery releases of resident trout into anadromous waters have been discontinued to reduce potential fishery conflicts with listed adult and smolt salmon and steelhead. Management of fisheries for species other than salmon and steelhead, including trout, sturgeon, and warmwater fish, has been tailored to minimize impacts on wild salmon and steelhead adults and juveniles, through timing and area restrictions, gear restrictions, limitations of hatchery releases, and by releasing hatchery fish at locations that minimize fishery interactions with listed fish.

Artificial propagation programs in the SRMA are part of harvest augmentation goals developed as part of the LSRCP. The LSRCP has established hatchery adult salmon and steelhead return goals for the Snake River basin as mitigation to lost harvest opportunities caused by the four lower

Snake River dams. The harvest regime is designed to maximize harvest of these hatchery fish while minimizing adverse impacts to listed wild salmon, steelhead, and bull trout. Fisheries are designed around the harvest of mitigation hatchery fish independent of forecasted abundances of wild fish. All hatchery chinook and steelhead are externally marked prior to release. Therefore, along with wild salmon and steelhead release regulations, all recreational fisheries directed at salmon and steelhead in SRMA are selective for the harvest of hatchery-origin fish. Season timing, gear restrictions, and area closures directing harvest on hatchery-origin fish are also used to minimize impacts to listed salmon and steelhead.

Prior to 2001, Snake River wild salmon populations were below levels that would enable WDFW to implement salmon-directed recreational fisheries without potentially causing adverse impacts to the wild fish. In recent years, wild and hatchery salmon populations in the SRMA have improved and WDFW implemented a recreational fishery directed at hatchery-origin spring chinook. As other wild salmon populations increase, WDFW will consider and may implement other salmon-directed fisheries in the SRMA.

Other sport fish seasons are designed to maximize catch of bass, walleye, catfish, crappie, yellow perch, sunfish, whitefish, northern pikeminnow, sturgeon, and carp. Fishery timing, gear allowed, and area openings are set to maximize fishing on the targeted species and minimize impacts to listed stocks. The number of salmon and steelhead handled in these fisheries is believed to be minor but no specific data exist for the SRMA catch. Data from creel surveys conducted from 1993-1996 in the area between Bonneville and McNary dams, and in 1994 between McNary and Priest Rapids dams show only 1% of steelhead were caught by non-salmonid anglers (James 1997). Based on creel surveys conducted in 1994 (James 1997), only 72 smolts (all species combined) were handled during April and May in the McNary Pool area. All other SRMA tributary fisheries are assumed to have less than 1% interception rate on listed stocks.

1.4.1) Provide escapement objectives and/or maximum exploitation rates for each population (or management unit) based on its status.

Fisheries management in the SRMA is mandated to provide hatchery salmon and steelhead for harvest purposes per the LSRCP (USACE 1975). These mitigation measures were authorized by Congress to compensate for the loss of fisheries that resulted after the construction and during operation of four lower Snake River dams. The LSRCP established return goals for hatchery-origin adult salmon and steelhead stocks in the Snake River basin based on an estimated loss of fish per stock. The goal for returning hatchery-origin adult spring chinook to the Tucannon River is 1,152 fish. Mitigation goals for returning hatchery-origin adult fall chinook to the Snake River is 18,300 fish. There are no return goals for hatchery-origin adult Snake River sockeye in the Washington portion of the basin. There are LSRCP mitigation goals for other Snake River salmonid stocks outside the SRMA that are not discussed in this document.

The LSRCP goals for returning adult steelhead are: 875 returning hatchery-origin adult steelhead to the Tucannon River, 1,500 to the Grande Ronde River, 130 to Asotin Creek, and 500 to the mainstem Snake River. It is WDFW's management objective to harvest as many hatchery-origin

steelhead as possible. All hatchery steelhead are externally marked prior to release, so they are available for harvest upon return.

Although these mitigation goals are for harvest purposes, the past condition of the Snake River wild salmon populations was such that implementing salmon-directed fisheries might have caused adverse impacts to wild populations. An adult salmon-directed fishery had not been implemented by WDFW from 1977 to 2000, except for a three-month fall chinook fishery in 1988 and fisheries directed at jack salmon, from 1988 to 1993 in the Snake River mainstem and through 1982 in the Tucannon River. Although hatchery augmentation programs are still on-going under the LSRCP, emphasis is shifting to develop indigenous hatchery stocks for supplementation and augmentation purposes, and to reduce potential hatchery augmentation impacts to wild fish. External marking programs for hatchery salmon have been in operation by WDFW since at least 1990. This marking allows the implementation of selective salmon fisheries directed at hatchery-origin salmon. Washington Department of Fish and Wildlife will continue to manage the salmon and steelhead fisheries in the SRMA to ensure escapement objectives are met at hatcheries and to minimize adverse affects to listed salmon and steelhead populations in the SRMA.

Management goals have been established by the WDFW for wild adult steelhead returning to the Tucannon River and Asotin Creek (WFW/WDW, 1993). These goals are outdated and were developed during a moderate to high ocean productivity cycle. A management goal of 600 wild spawning steelhead was established for the Tucannon River and 160 wild spawners returning to Asotin Creek. Current available data indicate that the goal for the Tucannon River has not been meet for over ten years. Table 2 illustrates the spawner escapement data for the Tucannon River and Asotin Creek steelhead.

Washington Department of Fish and Wildlife has not established management escapement goals for Snake River salmon stocks. However, NMFS has established recovery escapement goals for natural spawning chinook salmon in the Snake River basin. NMFS estimates that 2,500 naturally spawning Snake River fall chinook, counted at Lower Granite Dam, should ensure that the natural population is large enough to avoid the risks associated with critical population sizes (NMFS 1995). NMFS believes that the Snake River spring/summer chinook ESU is comprised of approximately 12 stocks and 40 subpopulations. Individual stock recovery goals were not established. An ESU escapement goal of approximately 31,440 naturally produced adult spring/summer chinook was established. This number is based on dam counts recorded at Lower Granite Dam (NMFS 1995) (Table 4).

Table 4. Dam counts of fall and spring/summer chinook at the Lower Granite Dam, 1975 to 2000 (ODFW/WDFW 2000a). No distinction between hatchery or wild origin.

Year	Fall Chinook		Spring/summer chinook		Sockeye
	Adult	Jacks	Adult	Jacks	Adult
1975	1,000	1,200	23,700	2,540	209
1976	470	830	22,900	7,500	531
1977	600	130	43,900	3,320	458
1978	640	850	52,300	1,020	123
1979	500	940	9,500	1,650	25
1980	450	330	8,200	2,060	96
1981	340	140	16,400	1,010	218
1982	720	1,500	16,600	700	211
1983	540	980	13,400	1,280	122
1984	640	730	11,900	3,200	47
1985	691	1,500	30,269	4,107	35
1986	784	1,801	37,876	2,562	15
1987	951	385	34,726	1,606	29
1988	627	329	35,640	1,286	23
1989	706	276	16,124	2,451	2
1990	385	190	22,408	362	0
1991	630	397	10,432	2,159	8
1992	855	102	24,405	831	15
1993	1,170	39	28,924	313	12
1994	791	255	3,915	116	5
1995	1,067	308	1,797	530	3
1996	1,308	424	6,814	2,583	3
1997	1,434	469	44,564	208	11
1998	1,909	2,002	14,208	437	2
1999	3,385	1,856	6,556	4,091	14
2000	3,602	7,112	37,755	14,054	282

Harvest of salmon and steelhead during recreational fisheries is estimated through the catch record card system developed by WDFW. Catch record cards are required for anglers fishing for salmon or steelhead in WDFW-regulated freshwater recreational fisheries. Anglers are required to record the species, date, age, and location of all salmon and steelhead retained. Angler recording errors occur in the data and include location code recording errors. Table 5 illustrates the 1989-90 to 1998-99 catch record card data for fisheries in the SRMA.

Table 5. SRMA salmon and steelhead harvest as reported by anglers through catch record cards (WDFW Sport Catch Reports 1990-1999).

Catch record card reporting areas.	The majority of Snake River steelhead angling occurs September through March.									
	89/90	90/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99
Snake River Mainstem										
Chinook (Jacks)	0	3	0	0	0	0	0	0	0	N/A
Steelhead, wild	0	0	141	671	309	133	477	340	272	144
hatchery	10,657	5,152	11,367	13,221	7,454	3,769	10,497	9,394	10,549	4,862
Tucannon River										
Chinook (Spring)	0	0	0	0	0	3	0	0	0	N/A
Steelhead, wild	0	0	6	4	0	0	10	6	0	44
hatchery	310	337	320	354	159	164	593	830	748	246
Asotin Creek										
Chinook	0	0	0	0	0	0	0	0	0	N/A
Steelhead, wild	0	0	0	0	0	0	3	0	0	0
hatchery	0	2	0	0	0	0	18	0	40	4
Grande Ronde River										
Chinook (Fall)	0	0	0	0	0	0	3	0	0	N/A
Steelhead, wild	0	0	10	49	57	28	50	33	86	30
hatchery	823	653	2,060	1,458	1,294	939	2,824	3,322	4,571	1,440

1.4.2) Description of how fisheries will be managed to conserve the weakest population or management unit.

Washington Department of Fish and Wildlife currently manages Snake River salmon-directed fisheries to maximize protection to, and promote recovery of, wild stocks. Recreational fisheries directed at salmon have not been implemented by WDFW in the SRMA since 1977, except a three-month fall chinook fisheries in 1988 and periodic jack salmon-directed fisheries in the Snake and Tucannon rivers. A hatchery-directed salmon fishery has been implemented in a portion of the Snake River in 2001. Commercial fisheries directed at salmon or steelhead in the Snake River are not authorized by WDFW. Salmon populations and future projects for Snake River basin salmon will be monitored by WDFW to determine when additional hatchery-directed salmon fisheries will occur.

Mass marking programs have been developed for all WDFW hatchery-origin chinook salmon released in the SRMA. All hatchery spring/summer and fall chinook released by WDFW in the Snake River basin are fin-clipped to distinguish them from native-origin fish. As native salmon populations improve, selective fisheries will be directed at hatchery-origin salmon. Fin-clipped hatchery-origin salmon can be easily distinguished from native-origin fish, and regulations requiring the release of naturally-produced salmon will be implemented.

Annual decisions whether or not to implement a salmon-directed fishery in the SRMA will be determined following the implementation processes discussed in Section 1.5 below. Historic, current, and future projected run sizes will be analyzed to determine if a wild population is resilient to impacts caused by recreational fisheries. Salmon-directed fisheries in the SRMA will be selective fisheries targeting hatchery-origin salmon. Wild salmon release regulations will be imposed. Important spawning and rearing habitats will be identified and will remain closed to recreational fisheries. Tributaries containing weak populations will remain closed to salmon-directed fisheries until populations become resilient to the potential impacts caused by salmon-directed recreational fisheries.

Current steelhead regulations direct harvest on surplus hatchery fish while minimizing impacts to depressed wild stocks. Wild steelhead release regulations during recreational fisheries were adopted for summer steelhead in the SRMA in 1986. This regulation will continue for all steelhead fisheries until self-sustaining wild steelhead populations have recovered to levels that the species is de-listed under ESA, and individual stock strengths may allow harvest fisheries. Commercial fisheries for steelhead in the SRMA are not implemented by WDFW and haven't been since the early 1900s (WDFW 2000). Area closures and fisheries timing are used to optimize wild steelhead stock protection during recreational steelhead fisheries. The upper Tucannon River watershed, and all tributaries to Tucannon and Grande Ronde rivers are closed to steelhead fishing to protect important natural spawning and rearing areas.

The management of Asotin Creek steelhead has been to close the fishery to protect the wild steelhead run in the basin. The Asotin Creek wild steelhead population has been in decline since 1986. Washington Department of Fish and Wildlife discontinued the release of hatchery steelhead in the basin to protect the wild steelhead populations and to provide a wild steelhead refuge area. WDFW also closed the steelhead-directed fishery in the basin to provide added protection to the wild steelhead. Asotin Creek will continue to be managed by WDFW as a close fishery for steelhead in the foreseeable future.

Trout fishing regulations are designed to provide protection for juvenile wild salmon and steelhead. Timing and size regulations have been incorporated by WDFW to minimize direct take of wild juvenile salmon and steelhead. Trout fishing is closed in tributaries and the Snake River during the salmon/steelhead smolt outmigration period. The State of Washington historically regulated a six-inch minimum size restriction and a daily limit of eight fish for resident trout. In 1994, WDFW changed the regulations to afford protection to fish eight inches or smaller and reduced the daily catch limit to two fish in streams and rivers. The Grande Ronde River and tributaries are afforded protection to fish 12 inches and smaller.

There is a six-fish daily limit for trout caught in the mainstem Snake River. This management regulation is set higher than the statewide rules to allow the harvest of residualized hatchery-origin steelhead that are common in the mainstem river and the four reservoirs. This regulation allows for the removal of hatchery fish that may compete with native-origin steelhead for food and spawning areas.

1.4.3) Demonstrate that the harvest regime is consistent with the conservation and recovery of commingled natural-origin populations in areas where artificially propagated fish predominate.

Washington Department of Fish and Wildlife had not implemented salmon-directed fisheries in the SRMA since 1977, with the exception of a three-month fall chinook fishery in 1988 and several years of jack salmon retention fisheries, despite LSRCP objectives. Artificial propagation programs continued during the salmon-directed fishery closures and during this time, WDFW developed salmon hatchery programs in the Snake River basin to include externally marking of all hatchery released chinook. With recent improvements in Snake River salmon populations and external marking programs for hatchery released salmon, WDFW has implemented salmon-directed fisheries in a manner that minimizes impacts to listed species through gear, time, and area restrictions and directing fisheries at hatchery-origin fish. Salmon-directed fisheries will be selective harvest fisheries targeting hatchery-origin fish. Wild salmon release regulations will be imposed until wild populations have recovered to a point where they are resilient to recreational fisheries impacts. Salmon-directed fisheries will be scheduled during the peak of hatchery migrations and in waters with higher concentrations of hatchery fish. As with steelhead, hatchery salmon release locations are in lower mainstem waters and near hatchery sites, downstream of natural production areas. Waters open for salmon-directed fisheries will be located in or downstream of salmon release locations and hatchery sites to maximize fisheries on hatchery-origin fish and to minimize impacts to wild fish. These fisheries will be monitored to determine the extent of impacts occurring to wild salmon populations.

Steelhead fisheries are designed to concentrate effort in hatchery-steelhead release locations and away from important natural production areas. To create spacial and temporal separation between hatchery- and wild-origin fish, hatchery-steelhead release locations in the major tributaries (Tucannon, Grande Ronde, and Snake rivers) are typically in less-productive habitat found in lower river reaches. Most of these waters are open to steelhead fishing, concentrating the fisheries on returning hatchery-origin fish. Most of the important natural production areas, including; Asotin Creek, upper watershed reaches and tributaries of the Tucannon River, and the Grande Ronde River, are closed to steelhead fishing. Mass marking programs externally mark all hatchery steelhead prior to release, allowing anglers quick and easy identification of the origin of the fish. Steelhead fisheries are generally scheduled during the peak of the hatchery-origin steelhead runs.

Trout fisheries are designed to occur primarily in areas where hatchery steelhead are stocked or in areas of marginal natural steelhead production. An increase in the daily retention limit of trout from 2 fish to 5 fish per day has been adopted in the lower sections of the Tucannon River and from 2 to 6 fish per day in the mainstem Snake River. These are stocking areas for hatchery-origin steelhead and the increased daily limit is designed to remove residual hatchery steelhead juveniles that fail to migrate to the ocean and minimize the potential adverse impacts of these hatchery stocks on wild steelhead.

Washington Department of Fish and Wildlife has developed size and gear restrictions and daily bag limits for resident recreational fisheries to minimize potential impacts to listed salmon and steelhead stocks. Juvenile fall chinook and the majority of spring/summer chinook salmon are not intercepted in fisheries because their small size does not allow them to recruit to resident fisheries (Waples et al. 1991). Some age 1+ juvenile spring/summer chinook and steelhead may recruit to the trout fishery. In recognition of this, WDFW delays the opening of trout season to June 1, until the majority of the spring/summer and steelhead migrants have emigrated from the tributaries (Myers et al. 1998). The general fishing season opening is delayed an extra two weeks in the Snake River mainstem to provide additional protection to outmigrating juvenile anadromous salmonids. In addition, the 8-inch minimum size restriction in tributaries protects 99% of the juvenile salmon and steelhead in these tributaries (T. Tynan, WDFW unpublished report; D. Rawding and J. Bumgarner, WDFW pers. comm.). It is illegal to harvest juvenile salmon in resident fisheries but if anglers do misidentify them as trout, the minimum size limits for trout protect over 99% of the juvenile salmon from harvest.

1.5) Annual Implementation of the Fisheries.

WDFW Major year regulation cycle

Implementation of recreational fisheries outside the PFM/North-of-Falcon and the Columbia River Compact processes is administered through the Washington Fish and Wildlife Commission. The sport rule adoption process is conducted on an annual basis. The ‘major year’ regulation cycle begins in the spring of the year, and involves solicitation from the public of recommendations for regulation changes. Public meetings are held, and further public review and comment is solicited. The public proposals are evaluated by department managers and technical staff, and recommended for action if appropriate. At the end of the year, the Commission closes the public comment period and takes oral testimony from the public in an open meeting. In February of the following year, the Commission meets to adopt rules, and the public is notified. Changes are effective May 1st annually, and notification to the public is incorporated into the State fishing pamphlet.

WDFW Minor year regulation cycle

The ‘minor year’ cycle regulations are amended through a separate, abbreviated process. Public proposals are not solicited, although WDFW staff may include recommendations from the public along with staff-generated proposals, commencing in early summer. Staff proposals are reviewed by the Fish Program, and the Director’s office approves those proposals to be sent to the Commission. The Commission reviews the proposals, solicits public comments, takes written comment and holds a public hearing on the proposals in December. The Commission meets in February to adopt rules, the public is notified, and changes are incorporated into the State fishing pamphlet, effective May 1.

WDFW In-season regulation changes

In-season changes to the adopted rules may be made, depending on changes in run sizes or other information, to further restrict the fishery for conservation needs or to expand a fishery when

population status of the target species warrants, and when impacts to weak stocks can be minimized. The in-season modifications to the planned fisheries are promulgated by emergency rule changes under the State Administrative Procedures Act.

U.S. v. Oregon/Columbia River Compact

U.S. v. Oregon/Columbia River Compact fisheries are not discussed in this FMEP. These mainstem Columbia River fisheries impact salmon and steelhead destined for the Snake River basin. The Technical Advisory Committee assessments of impacts to listed species, are evaluated through Section 7/10 consultation process.

Commercial fishery seasons on the portion of the mainstem Columbia River where the states of Oregon and Washington share a common boundary are regulated by a joint Oregon and Washington regulatory body, the Columbia River Compact. The ODFW and WDFW directors or their delegates comprise the Compact and act consistent with delegated authority by the respective state commissions. Columbia River seasons are also regulated by the U. S. v. Oregon process which dictates sharing of Columbia River fish runs between treaty Indian and non-Indian fisheries. The Compact receives input from the tribes, states, the federal government, and the fishing industry through a series of meetings held throughout the year. These meetings assist the Compact in developing harvest allocations and decisions related to monitoring harvest quotas. Meetings are held in late January of each year to establish the harvest guidelines for the spring and summer fisheries and in late July to establish guidelines for fall fisheries.

PFMC/North-of-Falcon

PFMC/North-of-Falcon fisheries are not discussed in this FMEP, but are evaluated during the annual pre-season planning process for ocean fisheries and authorized through Section 7 consultation.

Except where specifically authorized, according to the management framework developed within the annual Pacific Fishery Management Council/North of Falcon (PFMC/North-of-Falcon) agreements, salmon fisheries are closed. The PFMC/North-of-Falcon process includes the analysis of impacts to salmon stocks of concern, including those to ESA-listed salmon ESU. Preseason planning for Columbia River fisheries occurs during the North-of-Falcon process. Ocean sport, commercial, and tribal fisheries are heavily influenced by the abundance of Columbia River salmon stocks, and season structures in ocean fisheries must take into account the needs of the fisheries in the mainstem Columbia River and its tributaries.

SECTION 2 EFFECTS ON ESA-LISTED SALMONIDS

2.1) Description of the biologically-based rationale demonstrating that the fisheries management strategies will not appreciably reduce the likelihood of survival and recovery of the affected ESU(s) in the wild.

Current WDFW fishing regulations focus steelhead fisheries on hatchery-origin steelhead while implementing wild steelhead release regulations. The intent is to minimize impacts to depressed wild stocks. Recent creel surveys and hooking mortality calculations are used to estimate the Snake River mainstem, Tucannon River, and Grande Ronde River steelhead fisheries impacts to wild steelhead (Table 6). Up to 3% of the wild steelhead may be lost to incidental hook-and-release mortality during the recreational steelhead fisheries. This may be an over-estimate for some tributary steelhead fisheries, as more restrictive gear restrictions and area closures are prevalent in these waters. The harvest represents wild steelhead mortalities as a result of hook and release based on the total steelhead caught by recreational anglers, and not on run size.

Fisheries are managed by WDFW to protect and conserve listed species. Fishery closures are used in specific waters to protect and promote recovery for listed species. Important spawning and rearing habitats found in minor tributaries of the Snake and Grande Ronde rivers are closed to salmon and steelhead fishing and some tributaries of Asotin Creek and the Tucannon River are closed to all salmon and steelhead fishing (See Appendix A). Closing fisheries in these areas reduces the potential physical impacts that may occur during open fisheries. These closures may be lifted, if run forecasts and stock health indicates that populations have recovered sufficiently to support incidental impacts from angling pressure.

Table 6. Wild steelhead incidental harvest mortality (exploitation) from Snake River mainstem and Tucannon and Grande Ronde river fisheries based on creel surveys and catch record cards (CRC) from the 1997 to 2000 steelhead fisheries (G. Mendel WDFW).

River Reach	Wild (W) SH released ¹	Hatchery (H) SH caught ¹	Total H Kept	Proportion of W to H Kept	CRC harvest SH ²	Estimated W handled (proportion of CRC)	Hooking mortality (5.1%)	% Wild hook & release mortality based on CRC
IHR-LMO								
1999-2000	29	69	65	0.45	1,419	633	32	2.3%
1998-99	30	100	97	0.31	953	295	15	1.6%
1997-98	93	261	247	0.38	2,721	1,025	52	1.9%
LMO-LGO								
1999-2000	113	425	391	0.29	3,186	921	47	1.5%
1998-99	43	268	364	0.12	2,075	245	13	0.6%
1997-98	64	623	591	0.11	4,354	471	24	0.6%
LGO-LGR								
1999-2000	44	169	161	0.27	1,654	452	23	1.4%
1998-99	22	119	110	0.20	531	106	5	1.0%
1997-98	17	166	158	0.11	1,247	134	7	0.5%
LGR-Clarkston								
1999-2000	4	12	12	0.33	2,136	712	36	1.7%
1998-99	11	53	50	0.22	1,399	308	16	1.1%
1997-98	3	62	60	0.05	2,289	114	6	0.3%
Clarkston-OR								
1999-2000	128	255	214	0.60	3,067	1,834	94	3.1%
1998-99	131	479	431	0.30	2,654	807	41	1.6%
1997-98	51	490	407	0.13	4,468	560	29	0.6%
Tucannon								
2000-2001	38	90	60	0.63	N/A	N/A	N/A	N/A
1999-2000	49	199	116	0.42	1,140	482	25	2.2%
1998-99	18	49	29	0.62	290	180	9	3.2%
1997-98	32	303	146	0.22	748	164	8	1.1%
Grande Ronde								
2000-2001	8	39	17	0.47	N/A	N/A	N/A	N/A
1999-2000	8	7	2	4.00	2,064	8,256	421	20.4%
1998-99	5	31	8	0.63	1,470	919	47	3.2%
1997-98	0	4	2	0.00	4,597	0	0	0.0%
Total	941	4273	3738	0.25	44,462	11,193	571	1.3%

¹ Data collected from creel surveys conducted during the 1997/98 to 1999/2000 steelhead fisheries.

² Data collected from catch record cards from the 1997/98 to 1999/2000 steelhead fisheries.

IHR - Ice Harbor Dam
LMO - Lower Monument Dam
LGO - Little Goose Dam
LGR - Lower Granite Dam
SH - Steelhead

Recent creel surveys conducted during steelhead fisheries in the Snake River basin (Tables 7 and 8) indicate that chinook salmon are caught at less than one-tenth of a percent of the steelhead catch. These creel surveys indicate that sockeye salmon are not caught by steelhead anglers in the Snake River.

Table 7. Incidental catch of salmon in the Snake River mainstem steelhead fisheries based on creel survey data and evaluation of CRC (J. Bumgarner, WDFW, WDFW Sport Catch Reports 1990-1999)

River Reach	Chinook salmon released ¹	Hatchery (H) SH caught ¹	Total H Kept	Proportion of Chinook to H Kept	CRC harvest of Steelhead ²	Estimated Chinook handled (proportion of CRC)	Hooking mortality (5.1%)
IHR-LMO							
2000-01	1	130	127	0.008	N/A	N/A	N/A
1999-2000	N/A	69	65	0.000	1,419	N/A	N/A
1998-99	0	100	97	0.000	953	0	0
1997-98	0	261	247	0.000	2,721	0	0
LMO-LGO							
2000-01	0	138	134	0.000	N/A	N/A	N/A
1999-2000	N/A	425	391	0.000	3,186	N/A	N/A
1998-99	0	268	364	0.000	2,075	0	0
1997-98	8	623	591	0.014	4,354	60	3
LGO-LGR							
2000-01	0	54	54	0.000	N/A	N/A	N/A
1999-2000	N/A	169	161	0.000	1,654	N/A	N/A
1998-99	0	119	110	0.000	531	0	0
1997-98	9	166	158	0.057	1,247	71	4
LGR-Clarkston							
2000-01	1	19	18	0.056	N/A	N/A	N/A
1999-2000	N/A	12	12	0.000	2,136	N/A	N/A
1998-99	0	53	50	0.000	1,399	0	0
1997-98	0	62	60	0.000	2,289	0	0
Clarkston-OR							
2000-01	117*	803	625	0.187	N/A	N/A	N/A
1999-2000	N/A	255	214	0.000	3,067	N/A	N/A
1998-99	9	479	431	0.021	2,654	55	3
1997-98	2	490	407	0.005	4,468	22	1

¹ Data collected from creel surveys conducted during the 1997/98 to 2000/2001 steelhead fisheries.

² Data collected from catch record cards from the 1997/98 to 1999/2000 steelhead fisheries.

* This unusually high number is attributed to an unusually high number of jack salmon (up to 90% of the salmon caught in the creel) milling near the confluence of the Clearwater River and Snake River, and the high concentration of steelhead fisherman in the area. This area was where a majority of the steelhead angling was concentrated during the creel survey, and is where most of the steelhead were being caught in the Snake River mainstem.

IHR - Ice Harbor Dam
LMO - Lower Monument Dam
LGO - Little Goose Dam
LGR - Lower Granite Dam
SH - Steelhead

Table 8. Incidental catch of salmon in the Tucannon and Grande Ronde steelhead fisheries based on creel survey data and evaluation of CRC (J. Bumgarner, WDFW, WDFW Sport Catch Reports 1990-1998).

River	Chinook salmon released ¹	Hatchery (H) SH caught ¹	Total H Kept	Proportion of Chinook to H Kept	CRC harvest of Steelhead ²	Estimated Chinook handled (proportion of CRC)	Hooking mortality (5.1%)
Tucannon							
2000-2001	1	90	60	0.017	N/A	N/A	N/A
1999-2000	N/A	199	116	0.000	1,140	0	0
1998-99	0	49	29	0.000	290	0	0
1997-98	0	303	146	0.000	748	0	0
Grande Ronde							
2000-2001	0	39	17	0.000	N/A	N/A	N/A
1999-2000	N/A	7	2	0.000	2,064	0	0
1998-99	0	31	8	0.000	1,470	0	0
1997-98	0	4	2	0.000	4,597	0	0

¹ Data collected from creel surveys conducted during the 1997/98 to 2000/2001 steelhead fisheries. Creel data indicated only chinook were incidentally caught during steelhead fisheries.

² Data collected from catch record cards from the 1997/98 to 1999/2000 steelhead fisheries.

Salmon-directed fisheries in Washington are closed except where specifically authorized by WDFW. This allows WDFW to evaluate the status of each year's return before opening a fishery. Snake River basin salmon-directed fisheries will be selective harvest for hatchery-origin fish. Wild salmon release regulations will be imposed when a salmon-directed fishery is implemented. Catch and release survival will be maximized by the implementation of barbless hook restrictions during any salmon-directed fisheries. Data are not currently available for incidental catch of wild salmon during salmon-directed fisheries. A selective fisheries directed at hatchery-origin salmon has recently been implemented in the Snake River basin. Fisheries monitoring surveys will be carried out as part of salmon-directed fisheries implemented in the Snake River basin.

Washington Department of Fish and Wildlife has developed size and gear restrictions and daily bag limits for resident recreational fisheries to minimize potential impacts to listed salmon and steelhead stocks. Juvenile fall chinook and the majority of spring/summer chinook salmon are not intercepted in fisheries because their small size does not allow them to recruit to resident fisheries (Waples et al. 1991). Some age 1+ juvenile spring/summer chinook and steelhead recruit to the trout fishery. In recognition of this, WDFW delays the opening of trout season to June 1, until the majority of the spring/summer and steelhead migrants emigrated from the tributaries (Myers et al. 1998). The general fishing season opening is delayed an extra two weeks in the Snake River mainstem to provide additional protection to outmigrating juvenile anadromous salmonids. In addition, the 8-inch minimum size restriction in tributaries protects 99% of the juvenile salmon and steelhead in these tributaries (T. Tynan, WDFW unpublished report; D. Rawding and J. Bumgarner, WDFW pers. comm.). Regulations for mainstem Snake River provides a 10-inch minimum size restriction during trout fisheries and a 12-inch minimum size restriction is in effect on the Grande Ronde. It is illegal to harvest juvenile salmon in resident fisheries, but if anglers do

misidentify them as trout, the minimum size limits for trout protect over 99% of the juvenile salmon from harvest.

Washington Department of Fish and Wildlife has established a statewide rule that allows a daily catch limit of two hatchery steelhead, but no more than 30 per year. Once the daily bag limit has been retained, it is illegal to continue to fish for salmon or steelhead. Daily limits may vary within watersheds or be altered by emergency regulation if better-than-expected hatchery-origin returns occur or if run size is below expected numbers. Daily bag limits may also be modified to reduce potential impacts caused by fishing if the status of a stock is below management objectives

Warmwater game fish fisheries primarily occur in the lower sections of Snake River tributaries and in the mainstem Snake. Warmwater fisheries are concentrated in backwaters, sloughs, and shores of reservoirs which are not hospitable rearing areas for juvenile salmonids. Chinook and steelhead are not present in standing waters where most of the warmwater fisheries occur. Warmwater fisheries are also most active during warm summer months after most of the spring migrant juvenile salmonids have left the system and before fall juvenile migrant fall chinook disperse downstream from rearing areas.

2.1.1) Description of which fisheries affect each population (or management unit).

There is a potential that any fishery conducted in the SRMA may affect the listed local populations. However, due to fishery management regulations including time, area, and gear restrictions, WDFW is able to minimize impacts to the target species.

Steelhead fisheries -

Statewide rules for steelhead fisheries have been developed to protect wild salmon and steelhead populations while providing recreational angling. Only selective fisheries for hatchery-origin fish are permitted in the SRMA and anglers are required to release all non fin-clipped steelhead. To protect juvenile steelhead, a minimum size restriction is imposed. Steelhead must be at least 20 inches long and fin-clipped before retention. There is a two-fish daily limit on retaining hatchery steelhead, with an annual limit of 30 fish.

Summer steelhead are native to all the major basins and most minor basins within the SRMA. Summer steelhead enter fisheries from August through March or early April. Most of the steelhead catch occurs from September through February. Fisheries for summer steelhead occur in most rivers and retention is limited to hatchery steelhead under wild steelhead release regulations. Fisheries targeting hatchery-origin steelhead are not implemented in the Asotin Creek basin due to the current status of its stocks and management of Asotin Creek as a wild steelhead refuge area. Tributary and river section closures occur in the Tucannon and Grande Ronde basins. These closures are associated with natural production areas to protect natural spawners. Appendix A describes these time and area restrictions.

Steelhead fisheries occur within most areas of the SRMA. Historically, these fisheries were

directed at healthy stocks. As wild populations declined, regulations were implemented to reduce impacts on these fish, and hatchery fish were released to improve harvest opportunity under LSRCP funding. Currently, wild steelhead release regulations direct harvest towards abundant hatchery steelhead populations while protecting wild steelhead.

As steelhead populations change, WDFW fishery management strategies will change with them. Limits and regulations may change from year to year and from stream to stream. In-season adaptive fishery openings and emergency closures may occur within the Snake River basin and are based primarily on salmon and steelhead run strengths or numbers of returning hatchery fish.

Selective gear restrictions are imposed for most game fish fisheries in the SRMA, to improve incidental catch survival of wild salmon and steelhead. Tributaries where wild and hatchery run timing overlap, incidental hooking of wild salmon and steelhead may occur.

Salmon fisheries -

Washington Department of Fish and Wildlife statewide rules declare that salmon-directed fisheries are closed unless otherwise specified in Special Rules. Salmon-directed fisheries in the Snake River basin have not been implemented by WDFW since 1977, except for a three month fall chinook fisheries in 1988 and jack salmon-directed fisheries in the Snake River mainstem and for jack spring chinook in Tucannon River. Improvements in ocean survival rates, habitat, hatchery operations, fishing regulations and limitations, and dam passage have had positive impacts on Snake River salmon runs. Coupled with the WDFW and Co-manager's development of external marking programs for hatchery release fall and spring chinook, WDFW may implement salmon-directed fisheries that will not cause adverse impacts to wild populations. Salmon-directed fisheries in the SRMA will be selective for hatchery-origin fish, with wild salmon release regulations. Recreational salmon-directed fisheries are designed to fish the peak of the hatchery runs and may open April through July in streams containing spring chinook runs and August through November in streams with fall-run chinook runs. Salmon directed fisheries would vary from year to year and from stream to stream depending on the health status of salmonid populations and run-size forecasts for each particular stream.

S Snake River salmon populations in the past were at levels that WDFW believed adverse impacts to wild populations may have occurred if fisheries directed at salmon were implemented. Improvements in Snake River salmon population numbers have prompted WDFW to evaluate the implementation of salmon-directed fisheries. Mass marking programs will allow WDFW to implement selective salmon fisheries directed at hatchery-origin fish, reducing to potential impacts to wild fish that may occur during a directed fishery. Washington Department of Fish and Wildlife will monitor run sizes and projected run sizes of the salmon populations in the Snake River basin. As the Snake River chinook populations remain at levels above which WDFW determines that salmon-directed fisheries will not cause adverse impacts to wild runs, WDFW will consider implementing salmon fisheries directed at hatchery-origin fish. Fisheries implementation requires the cooperation of Treaty Tribes, the States of Oregon and Idaho, local, and federal governments. Strong salmon runs will not automatically lead to the implementation of salmon

fisheries directed at hatchery-origin fish. Salmon fisheries directed at hatchery-origin fish will implement by WDFW when coordination and cooperation is achieved and projected salmon runs are sufficient to support these fisheries.

A Snake River spring chinook fishery has been implemented beginning in 2001 in conjunction with the mainstem Columbia River recreational spring chinook fishery and would not impose a total fisheries impact to Upper Columbia River/Snake River spring chinook stocks of greater than 2% (ODFW/WDFW 2000b). That is, all Columbia and Snake River non-tribal recreational spring chinook fisheries would not impose more than a 2% impact to the Snake River spring chinook salmon. If the Columbia River mainstem recreational fisheries cause 2% or more impact on spring chinook, this Snake River spring chinook fishery will not be implemented. Salmon-directed fisheries beyond 2001 may not be managed in conjunction with the Columbia River fisheries, impacts caused by the fisheries would be assessed based on Snake River salmon populations and impacts to these populations. The Snake River mainstem spring chinook fishery is a selective fishery for hatchery fish only, and wild spring chinook release is required.

Washington Department of Fish and Wildlife has established statewide rules that allow a catch limit of two salmon per day at least 12 inches long, however, daily limits may vary from stream to stream. The size restriction is designed to protect juvenile salmonids. Once the daily bag limit has been retained, it is illegal to continue to fish for salmon. As populations change, WDFW management strategies will change with them. Limits and regulations may change from year to year or stream to stream. In-season adaptive fishery openings and emergency closures may occur throughout a season. Decisions for fishery rule changes are based on run-size forecasts for a particular year and/or the strength of the hatchery adult returns. Fishery openings or closures may be proposed at any time during a fishery season.

Resident Trout -

Washington Department of Fish and Wildlife has established statewide rules for trout fisheries designed to provide recreational angling while at the same time protecting wild salmon and steelhead populations. Trout fisheries are generally scheduled from June through October, in rivers, streams, and beaver ponds, and year-round in lakes, ponds, and reservoirs, unless otherwise specified in Special Rules. Trout fisheries incorporate minimum size restrictions designed to protect juvenile salmon and steelhead. There is a two-fish daily limit and an eight-inch minimum size restriction in tributary areas, except in portions of the Tucannon River and mainstem Snake River. These areas allow a larger daily retention limit and are in river sections associated with hatchery steelhead release locations. Size restrictions in the Grande Ronde River afford additional protection for fish 12 inches or smaller, while the Snake River mainstem protects fish 10 inches or smaller. All wild adult salmon, steelhead, and bull trout must be released in the SRMA .

Trout fisheries have the potential to impact listed juvenile salmonids. However, WDFW has implemented time and area restrictions, which greatly reduce potential impacts. The trout season is open from June 1 to October 31 and closed during the height of the smolt outmigration.

Washington Department of Fish and Wildlife and other agencies operated juvenile outmigrant traps in Columbia and Snake River tributaries to determine the timing of the wild salmon and steelhead smolt outmigration. In all years wild migration increased in April, peaked from late April to mid-May, and concluded in early June. Over 95% of the wild steelhead and coho smolts had completed their downstream migration out of tributaries by June 1.

Selective gear restrictions are imposed in the upper Tucannon River, Pataha Creek, Asotin Creek, and in the Grande Ronde River. These restrictions only allow the use of unscented artificial flies or lures, prohibit the use of bait, and fish may be released until the daily limit is retained. No one may fish from any floating device equipped with a motor, except where specifically allowed under Special Rules for individual waters. Non-buoyant lure and night fishing restrictions are imposed in specific waters to prevent illegal snagging.

Fisheries for resident trout take place in tributaries and standing waters throughout the Snake River basin. Plants of hatchery reared trout for put-and-take fisheries have been restricted to standing waters, streams below native anadromous spawning and rearing habitat, and streams below dams blocking passage of anadromous fish to minimize impacts on salmon and steelhead smolts.

Other Resident Fish Species -

Fisheries for other fish species, such as whitefish, bass, walleye, catfish, crappie, yellow perch, sunfish, northern pikeminnow, sturgeon, and carp occur each year in the Snake River and various tributaries. Salmon and steelhead bycatch levels in these fisheries are believed to be low. Data from creel surveys conducted from 1993 through 1996 in two areas of the Columbia River indicate that only 1% of the total number of steelhead harvested during those years were caught by non-salmonid anglers (James 1997). Recent creel surveys by the University of Idaho found few or no anglers targeting steelhead in the Snake River mainstem during spring and summer until August when hatchery steelhead return in sufficient numbers (Deau 1999).

Whitefish fisheries are scheduled during the winter months when whitefish congregate in deep pools preparing for spawning. Adult chinook salmon are not present, and juveniles remain in the gravel at this time and cold water temperatures keep them relatively inactive. Gear restrictions are not typically imposed on whitefish fishery. Legitimate whitefish gear is not typical of steelhead or salmon angling gear. Washington Department of Fish and Wildlife staff will review statewide whitefish fishery regulations during the major rule cycle in 2001, with the intent of providing consistent protection for listed salmon and steelhead. Regulations, similar to the rules promulgated for the whitefish fishery under the Upper Columbia River ESA Section 10 permit # 1248, are being considered for statewide adoption. These rules limit gear to a single, barbed baited hook no larger than size 14 (thereby limiting bait to a single egg, maggot, or grub). It is believed these gear rules would allow legitimate whitefish fisheries to continue while minimizing the encounter rate and hooking mortality of steelhead or salmon co-inhabiting whitefish holes in the winter. A limit of 15 whitefish per day is allowed.

Participation in whitefish fishery is very limited in the Snake River basin (G. Mendel, WDFW, pers. comm.). Limiting factors for the participation in this fishery include access to productive fishing areas and winter weather conditions. Adult and juvenile steelhead may be present during whitefish fisheries in the Snake River basin. Other whitefish fisheries outside the Snake River basin (Methow and Wenatchee rivers) experienced low participation and no *O. mykiss* were recorded in the catch (WDFW, 2000b).

Other resident game fish fisheries may occur year-round within the SRMA. Much of the other game fish angling however, is concentrated after the spring runoff when flows and warm water temperatures permit successful angling. Targeted species include warm water species, such as bullhead, walleye, largemouth and smallmouth bass, and channel catfish. Selective gear requirements are imposed in the upper Tucannon, Pataha Creek, Asotin Creek, and in the Grande Ronde River while angling for any game fish.

Warmwater game fish fisheries primarily occur in the lower sections of SRMA tributaries and the mainstem Snake River for species including largemouth bass, smallmouth bass, channel catfish, crappie, bluegill, carp, and northern pikeminnow. Warmwater fisheries also occur in standing waters throughout the SRMA. Salmon and steelhead impacts in warmwater fisheries are extremely limited. In the SRMA tributaries and mainstem, warmwater fisheries are concentrated in backwaters, sloughs, and shorelines of reservoirs behind the Snake River dams, which are not hospitable rearing areas for juvenile salmonids. Adult salmon and steelhead are not present in standing waters where warmwater fisheries occur. Fishery participation is concentrated during warm summer months after most of the spring migrant juvenile salmonids have left the system and before fall migrant juvenile chinook disperse downstream from rearing areas. Since warmwater species potentially prey on and compete with juvenile salmonids, warmwater fisheries provide some marginal benefit for listed salmon and steelhead if the warmwater species catch were significant, by removing competition and predation.

2.1.2) Assessment of how the harvest regime will not likely result in changes to the biological characteristics of the affected ESUs.

Low harvest impact rates which will result from implementation of selective fisheries for fin-clipped hatchery salmon and steelhead will substantially reduce the potential for fishing-related changes in biological characteristics of wild salmonids. Fishing impact rates are small and spread over the breadth of the run so that no subcomponent of the wild stocks will be selectively harvested at a rate substantially larger than any other portion of the run. No significant harvest differential will occur for different size, age, or timed portions of the run. In addition, low exploitation rates for wild fish will result in increased numbers of wild spawners even in periods of poor freshwater migration and ocean survival conditions. Larger populations will be less subject to genetic risks and loss of diversity associated with small population sizes. Finally, increased harvest rates of hatchery fish in selective fisheries should benefit wild stock integrity and diversity by removing a greater fraction of the hatchery fish which could potentially stray into wild production areas.

2.1.3) Comparison of harvest impacts in previous years and the harvest impacts anticipated to occur under the harvest regime in this FMEP.

Recreational fisheries for steelhead occur within most major rivers in the SRMA, with the exception of the Asotin Creek basin, while tributary streams remain closed. Historically, these fisheries were directed at healthy wild stocks. As wild fish populations declined, fishery restrictions designed to limit harvest impacts, including time and area closures, were adopted. In the 1950's, hatchery steelhead were released to provide improved harvest opportunity in mainstem and tributary fisheries. Due to the continued decline of wild steelhead populations, the retention of steelhead was prohibited in the SRMA starting in 1977. Fisheries for steelhead did not reopen until 1984 when selective harvest for hatchery steelhead commenced in the mainstem Snake River (Figure 4). Tributaries fisheries for steelhead remained closed for an additional two years when, in 1986 portions of the Tucannon and Grande Ronde rivers were open for selective harvest of hatchery-origin steelhead. Wild steelhead release regulations were adopted by WDFW in the SRMA in 1986 to direct fishery harvests toward abundant hatchery steelhead populations, while protecting vulnerable wild steelhead. Asotin Creek has remained closed since 1976. In the 1980's and 90's large numbers of hatchery steelhead were released as mitigation to hydroelectric projects as part of the LSRCP and other Columbia River basin plans.

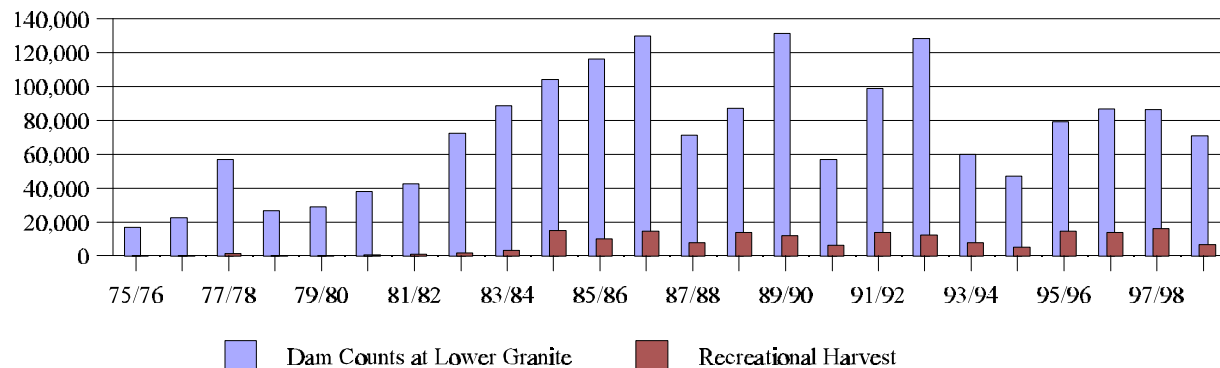


Figure 4. Steelhead dam counts tallied at the Lower Granite Dam and the recreational steelhead harvest from the Snake River Basin (including tributaries) based on catch record cards received from recreational anglers. Catch record cards may represent recording error, species misidentification, or illegal harvest (ODFW/WDFW 2000a).

Harvest of wild steelhead has dropped dramatically since wild steelhead release regulations. However, very few data are available from tributaries in the SRMA concerning wild fish escapement and harvest estimates prior to wild steelhead release regulations.

Ongoing research programs on the Kalama River, a lower Columbia River tributary, have collected data on wild steelhead escapement of harvest impacts. Although these data were not collected in the SRMA, they are representative of the changes in wild steelhead harvest rates under WDFW management regimes. Harvest rates for summer steelhead declined from over 50% under harvest fisheries to less than 6% in wild steelhead release fisheries in the Kalama River.

Incidental hooking and landing of wild steelhead may occur during fisheries targeting hatchery-origin steelhead, and other salmonids. The mortality rate has been estimated to be about 5% of incidental catch and released fish (Mongillo, 1984). Rawding (2000) reported hooking mortalities to be approximately 1 to 5% during recreational winter steelhead angling and approximately 8% during recreational summer steelhead angling.

Creel surveys conducted in 1999 indicate that approximately 26% of the steelhead caught in the Snake River mainstem recreational steelhead fisheries are wild steelhead (Table 6). Wild steelhead release regulations, area closures, and gear restrictions are used to protect native fish and wild productive areas to protect and promote the recovery of the listed steelhead in the basin.

Long-term historical creel and population survey data are not available for all Snake River steelhead populations. Current data are available from creel surveys conducted from 1984 to 2000 and evaluations of historical catch record cards (CRC) received from recreational anglers. Catch record cards are subject to errors, such as species misidentification and misreporting of catch locations. Based on creel surveys conducted on the mainstem of the Snake River in 1999-2000, 26% of the steelhead caught in the mainstem fishery were wild steelhead. Fisheries in the SRMA are managed for wild steelhead release. Data concerning incidental hooking of salmon were also collected during these surveys. These data are illustrated in (Tables 7 and 8).

Salmon-directed fisheries were not implemented from 1977 to 1988 in response to declining Snake River salmon populations. A three-mouth fall chinook fishery was implemented for the Snake River mainstem in 1988 and jack salmon-directed fisheries were implemented from 1988 to 1993 in the Snake River mainstem and up until 1982 for jack spring chinook in the Tucannon River. Snake River salmon populations in the past were at levels that WDFW believed adverse impacts to wild populations may have occurred if fisheries directed at salmon were implemented. Improvements in Snake River salmon population numbers have prompted WDFW to evaluate the implementation of salmon-directed fisheries. Mass marking programs will allow WDFW to implement selective salmon fisheries directed at hatchery-origin fish, reducing the potential impacts to wild fish that may occur during a directed fishery. Run size of the salmon populations in the Snake River basin will be monitor by WDFW. When Snake River chinook populations are at levels above which WDFW determines that salmon-directed fisheries will not cause adverse impacts to wild runs, WDFW will consider implementing salmon fisheries directed at hatchery-origin fish. Fisheries implementation requires the cooperation of Treaty Tribes, local, and federal governments. Strong salmon runs will not automatically lead to the implementation of salmon fisheries directed at hatchery-origin fish. Salmon fisheries directed at hatchery-origin fish will be implemented by WDFW when coordination and cooperation is achieved and projected salmon runs are sufficient to support these fisheries.

The take of listed salmon and steelhead during Snake River fisheries are listed in Table 9.

Table 9. The anticipated encounters (take) and estimated mortality to listed stocks per fishery, in the SRMA (Tables 6, 7, and 8,).

Affected stock	Status	Escapement goal	Fisheries ¹											
			Steelhead		Salmon ²		Res. Trout		Whitefish		Others		Total AE	Total EM
			AE ³	EM ⁴	AE	EM	AE	EM	AE	EM	AE	EM		
Tucannon Summer steelhead	Depressed	600	275	14	0	0	1,500 parr (15 adult equiv.)	77 parr (< 1 adult equiv.)	0	0	12 parr (< 1 adult equiv.)	0	1,512 parr 275 adults	77 parr < 15 adults
Asotin Cr. Summer steelhead	Depressed	160	0	0	0	0	500 parr (5 adult equiv.)	26 parr (< 1 adult equiv.)	0	0	2 parr (< 1 adult equiv.)	0	502 parr 0 adults	26 parr
Snake River Summer Steelhead	N/A	N/A	2,900	148	0	0	1,000 parr (10 adult equiv.)	51 parr (< 1 adult equiv.)	0	0	20 parr (< 1 adult equiv.)	0	1,020 parr 2,900 adults	51 parr 148 adults
Grande Ronde Summer steelhead	Depressed	N/A	3,050	156	0	0	1,000 parr (10 adult equiv.)	51 parr (< 1 adult equiv.)	0	0	10 parr (< 1 adult equiv.)	0	1,010 parr 3,050 adults	51 parr 156 adults
Tucannon Spring Chinook	Depressed	N/A	1	0	N/A	N/A	170 parr (1.7 adult equiv.)	8 parr (< 1 adult equiv.)	0	0	12 parr (< 1 adult equiv.)	0	182 parr 1 adults	9 parr < 1 adult
Asotin Spring Chinook	Critical	N/A	0	0	N/A	N/A	0	0	0	0	2 parr (< 1 adult equiv.)	0	2 parr	< 1 parr
Snake River Chinook Spring/Summer	Depressed		5	0	N/A	N/A	170 parr (1.7 adult equiv.)	8 parr (< 1 adult equiv.)	0	0	20 parr (< 1 adult equiv.)	0	190 parr 5 adults	10 parr < 1 adult
Snake River Chinook Fall	Depressed	2,500 ⁵	165 ⁶	8	N/A	N/A	500 parr (5 adult equiv.)	26 parr (< 1 adult equiv.)	0	0	20 parr (< 1 adult equiv.)	0	520 parr 165 adults	26 parr 9 adults
Snake River Sockeye	N/A	N/A	0	0	N/A	N/A	5 parr (< 1 adult equiv.)	0	0	0	2 parr (< 1 adult equiv.)	0	7 parr	< 1 parr

¹ The anticipated encounters for the resident trout, whitefish, and others fisheries are based of SWAGS and professional judgement and knowledge of the local fisheries and angling tendencies. Data are not available for these fisheries' impacts on salmon and steelhead.

² Salmon-directed fisheries had not been implemented in the Snake River basin for several years. Data are not available for incidental hooking of wild listed fish during salmon-directed fisheries. Creel monitoring surveys will be conducted in conjunction with the implementation of salmon-directed fisheries in the Snake River basin and this table will be update as data become available. The current harvest regime does not include a fall chinook-directed fishery. A fall chinook-directed fishery may be implemented in the future.

³ Anticipated Encounters (AE) are catch and released fish. These numbers are based on creel surveys, catch record cards (Table 6), and professional experience and judgement and represent the number of fish from a stock anticipated to be incidentally encountered by anglers of a particular fishery.

⁴ Estimated Mortality (EM) is the hooking mortality of incidentally caught fish, based on 5.1% (Mongillo 1984; WDFW unpublished). Expected mortalities are included in Anticipated Encounters in terms of take. This may be a conservative estimate, fish may be hooked more than once elevating hooking per fish mortality rates.

⁵ NMFS draft recovery plan recovery goal as counted at Lower Granite Dam.

⁶ An unusually high number of jack salmon was observed near the confluence of the Clearwater and Snake rivers during creel surveys conducted in 2000/2001. This coincided with an unusually high concentration of steelhead and steelhead anglers in this area, producing an inflated incidental hooking rate of salmon during the 2000/2001 steelhead fishery (Tables 7 and 8).

Take Discussion:

Encounter rates of salmon and wild steelhead during steelhead targeted angling in the Snake River basin are based on the three year average, 1997/98 to 1999/00, of catch record cards and creel surveys conducted in major watersheds where steelhead fisheries are open, Tucannon, Grande Ronde, and Snake rivers. Creel survey data for the past three years indicate that wild steelhead comprise about 25% of the total steelhead caught during steelhead angling (Table 6). These fish are required to be released. Harvest of salmon and wild steelhead (incidental hooking mortality or illegal harvest) is based on creel surveys and catch record cards WDFW received from anglers. Catch record cards may represent fish misidentification or recording error, e.g. incorrect catch location codes, or the recording of fish caught and released.

Washington Department of Fish and Wildlife had not implemented salmon-directed fisheries in the Snake River basin since 1977, except for a three month fall chinook fishery in 1988 and periodic jack salmon-directed fisheries. No current fisheries monitoring data are available for salmon-directed fisheries in the Snake River basin. As WDFW implements salmon-directed fisheries, monitoring surveys will be conducted in conjunction with these fisheries to evaluate impacts to listed wild salmonid populations. Wild and hatchery-origin runs overlap. Without current data, there is no way of accurately estimating the impact of a selective salmon-directed fishery on salmon. Current take estimates are based upon the best professional judgement of local biologists.

Resident trout fishery are not monitored in streams and rivers because of resource limitations. Instead, encounter estimates are based on professional experience and judgement. Based on the timing of the resident trout fishery in the tributaries of the Snake River, most encounters with salmon and steelhead are juvenile, pre-smolt (parr) or resident steelhead. Many migrant smolts and adult fish are not present in areas of the Snake River tributaries where and when trout can legally be harvested (adults present in upper basin from Nov. - May; smolts migrate in April and May when the trout fishery is closed to protect salmon/steelhead smolts). Parr and resident or residualized steelhead are available and occasionally harvested during resident trout fisheries.

Very little data are available to the WDFW on numbers of juvenile steelhead caught or kept during the trout fishery. In 1985, a creel survey was conducted on a portion of the Tucannon River where hatchery trout were released and anglers concentrated their efforts because of the fish stocking and public access. Considerable hooking and releasing of wild rainbow and steelhead juveniles occurred, although direct harvest of wild fish was estimated to be only 0.6% (279 fish) of the total harvest (Schuck and Mendel 1987). Anglers cannot identify a wild steelhead from a resident trout and state fishing regulations allow them to keep either fish. Sixty-six percent of Tucannon River anglers use some form of bait (A. Viola, WDFW, personal communication, 1993). Since these studies, hatchery trout releases have been terminated in the Tucannon River, bait fishing has been restricted and minimum size limits of 8 inches have been imposed. The South Fork and North Fork of Asotin Creek, upstream of United State Forest Service (USFS) boundary and all their tributaries and all tributaries of the Tucannon River and headwaters upstream of the Panjab Bridge on the Tucannon River mainstem are closed to all

fisheries.

As with the resident trout fishery, warmwater and whitefish fisheries have not been monitored and salmon and steelhead encounter estimates are based on professional experience and judgement. The warmwater fishery occurs entirely in the lower mainstems of the Tucannon and Grande Ronde rivers, Asotin Creek, other minor Snake River tributaries, and in the mainstem Snake River, areas that are not believed to be an important steelhead or salmon rearing area because of summer water quality (temperature, sediment, etc.) problems. These are primarily migration corridors for salmon and steelhead. Although much of the gear and the fishing techniques used to catch warmwater fish are not conducive to catching steelhead or salmon, some methods may attract listed fish. As these fisheries, juvenile salmon and steelhead outmigration, and spring chinook spawning migration overlap, incidental hooking of salmon and steelhead may occur. Although these warmwater fisheries are year-round, effort decreases precipitously as summer progresses into fall months and water temperature drops. By August and September, when adult steelhead and fall chinook begin to enter the rivers, warmwater fishing effort is very low.

There is very little participation in the whitefish fisheries in the Snake River basin (G. Mendel, WDFW, pers. comm.). Relatively few anglers specialize in winter whitefish fishing due to weather conditions and air temperatures. The fishing methods and the type of water fished is more suited to whitefish than trout and few steelhead encounters are expected.

Other sport fish seasons are set to maximize catch of bass, walleye, catfish, crappie, yellow perch, sunfish, whitefish, and northern squawfish, sturgeon, and carp. The number of salmon and steelhead handled in these fisheries is believed to be minor but no specific data exist for the Snake River or its tributaries. Data from creel surveys conducted from 1993-1996 in the area between Bonneville and McNary dams, and in 1994 between McNary and Priest Rapids dams show only 1% of the fish caught by non-salmonid anglers to be steelhead (James 1997). Based on creel surveys conducted in 1994 (James 1997), only 72 smolts (all species combined) were handled during April and May in the McNary Pool area.

2.1.4) Description of additional fishery impacts not addressed within this FMEP for the listed ESUs specified in section 1.3. Account for harvest impacts in previous years and the impacts expected in the future.

Steelhead are rarely caught in ocean fisheries and thus these fisheries are not considered a significant source of mortality to Snake River steelhead (NMFS 2000a). Snake River steelhead may be caught in mainstem Columbia River recreational and commercial fisheries as well as treaty tribal fisheries as they migrate to their spawning streams. The NMFS Biological Opinions (2000a and 2000b) indicate a maximum harvest rate of < 6% and an expected harvest rate of 3.3% may occur on Snake River A and B steelhead runs during Columbia River mainstem non-Indian fisheries. Treaty Indian fisheries directed at steelhead in the Columbia River may harvest 24.3% of the Snake River A and B steelhead. Retention of steelhead during non-treaty commercial fisheries in the Columbia River was prohibited in 1975 and continue to be prohibited.

Commercial salmon fisheries are set to optimize chinook or coho catch and minimize steelhead catch through the use of time and area closures and gear restrictions. The harvest rates on Snake River steelhead are not expected to change dramatically in the near future.

NMFS (2000c) concluded that although Snake River spring/summer chinook may, on occasion, be taken during ocean fisheries, the overall ocean exploitation rate is likely less than 1% and is not considered significant. Snake River spring/summer chinook are subject to harvest in Columbia River mainstem non-Indian recreational and commercial harvest and Treaty Indian fisheries. NMFS (2000b) set the maximum harvest rate for Snake River spring/summer chinook during non-Indian Columbia River mainstem recreational and commercial fisheries to be less than 3%, and the expected rate at 0.8%. Treaty Indian fisheries are expected to be managed at a higher harvest rate. Snake River spring chinook are expected to be harvested at a 9% rate and summer chinook at less than 5%. Total Treaty Indian Columbia River fisheries harvest rates on Snake River spring/summer chinook are estimated to be less than 14%. As Snake River spring/summer chinook runs continue to show improved return numbers, Columbia River fisheries harvest rates are expected to remain below 20%. Treaty Indian fisheries also occur in the Snake River and Snake River tributaries, including the Salmon River. Treaty Indian fisheries occurring in the Snake River basin are estimated to harvest 140 listed Snake River spring/summer chinook (NMFS 2000c).

Snake River fall chinook are encountered during ocean and Columbia River fisheries. Ocean exploitation rates are required to achieve a 30% reduction in the average 1988-93 base period for Snake River fall chinook. Since 1996, this reduction has been 37% and the expected combined 2000 ocean fisheries was at a 45% reduction (NMFS 2000a). Columbia River mainstem fisheries that impact Snake River fall chinook are non-Indian commercial and recreational fisheries and Treaty Tribal fisheries. NMFS (2000a) estimated the harvest rate of Snake River fall chinook during non-Indian commercial and recreational fisheries to be 8.25% and the Treaty Tribal fisheries to be 23.04%.

Recreational fisheries in the Idaho portion of the Snake River basin that may impact listed anadromous salmonids are addressed in ESA Section 10 permit # 1233, which provides coverage for a five year period, years 2000 - 2004. Recreational fisheries addressed in this ESA Section 10 permit include steelhead, salmon, and general fishing (NMFS 2000c).

Snake River sockeye salmon are not likely to be caught during salmon-directed fisheries off the west coast (NMFS, 2000b). During the January through July 2001 Columbia River fisheries, Snake River sockeye salmon impacts are projected to be limited to 1% of the return. This includes all non-Indian commercial and recreational fisheries scheduled to occur during the Winter, Spring, and Summer fisheries (ODFW/WDFW, 2000b).

SECTION 3 MONITORING AND EVALUATION

3.1) Description of the specific monitoring of the “Performance Indicators” listed in section 1.1.1.

Performance indicators for wild Snake River salmon and steelhead include fish population indicators and fishery indicators. Since the objective of this FMEP is to provide fishing opportunity consistent with the recovery of listed species and at rates that do not jeopardize their survival or recovery, the primary indicators for this FMEP are the abundance and productivity of wild salmon and steelhead stocks.

Abundance and Productivity

Spawner and redd surveys

Spawning surveys are conducted annually on index streams in the Tucannon and Asotin watersheds and periodically in other streams and watersheds based on funding, personnel, and timing of past completed surveys. Index streams, selected for their representation of the basin, are surveyed from March through May for steelhead and August through October for salmon. The surveys are conducted once a week, with the intent to estimate spawning escapement into these watersheds. Index sections, about 2-3 miles in length, are surveyed multiple times throughout the season to document redds and how quickly redds fade from sight of the surveyors. During each survey, surveyors generally walk down the bank and out of the water when possible. Surveyors look for redds, record and mark their location, and look for live and dead fish. The final survey of the season includes a more extensive area, generally 50-70% of the river or tributary being surveyed. The “final survey” redd count and redd visibility/fading rate are then used in conjunction with trap counts from traps located on the Tucannon River to estimate the spawning escapement to the system. Estimates from steelhead redd surveys were calculated using the standard WDFW methodology (Freymond and Foley, 1984).

Electrofishing and snorkel surveys

Summertime electrofishing and snorkel surveys are conducted annually in the Tucannon River and Asotin Creek, and are occasionally conducted in other tributaries of the Snake River basin, to estimate densities and the population of Age 0 and Age 1+ summer steelhead throughout the Snake River basin to compare with historical records since 1984. Data from electrofishing and snorkel surveys can also be used to determine the degree of residual steelhead remaining in the river following hatchery supplementation releases. These surveys are dependent on the acquisition of funding and may not occur in all basins of the SRMA. Snorkel surveys may also be used in association with redd surveys to estimate spawner numbers.

Carcass surveys

Carcass surveys for spring chinook are conducted annually in the Tucannon River. Surveyors search river sections for live and spawned out spring chinook carcasses, mark the carcasses with external marks to prevent double counting, and enumerate carcasses. Surveys are conducted weekly during the spawning season. After collecting biological and mark sampling data and

tagging the carcasses, the fish are replaced as close as possible to their original locations.

Dam and trap counts

There are four major dams transecting the Snake River in the SRMA, each with fish passage facilities equipped with fish counting mechanisms. These facilities are efficient at enumerating the number of fish returning to the Snake River. Daily fish passage is recorded at each dam and the data are stored in accessible databases. These dam counts are efficient for estimating fish populations returning to a region, however, they provide only an index for tributary populations. Traps are also used to estimate salmonid populations. Although not as efficient as the dam counts from the Snake River dams, traps counts provide insight into tributary populations. Traps are located in the Tucannon River and tributaries of the Grande Ronde River and are useful for enumerating spring chinook and steelhead stocks. Fall chinook populations are monitored annually by dam counts at the Lower Granite dam and the fish trapping facility located at the Lyons Ferry hatchery on the mainstem Snake River between Lower Monumental and Little Goose dams. Fall chinook run reconstruction is calculated annual from returns at Lower Granite Dam.

Juvenile salmonid evaluations

A floating rotary screw trap is operated at River Mile 1.9 on the Tucannon River. This trapping facility is capable of year-round operation, but is primarily operated during juvenile salmonid outmigrations, from Mid-March to June. Data collected from the trap are used for estimating the magnitude, duration, periodicity, and peak of salmon and steelhead smolt outmigration from the Tucannon River.

Snorkel surveys are used to estimate juvenile salmonid abundance and presence in selected sections of streams and rivers. Juvenile salmonid snorkel surveys are conducted in the Tucannon River and Asotin Creek. Surveyors snorkel suitable rearing habitats along selected stream sections and enumerate juvenile salmonids.

PIT Tag study

Passive Integrated Transponder (PIT) tag studies are conducted annually to evaluate outmigration timing, speed the migration, and survival of hatchery and naturally produced chinook and steelhead smolts. Juvenile steelhead and spring chinook are trapped at smolt trapping facilities on the Tucannon and Grande Ronde rivers and outfitted with PIT tags. PIT tag receivers are located on all the fish passage facilities on all the dams located of the mainstems of the Snake and Columbia rivers. Data collected from these studies will allow WDFW to assess the downstream survival, dam passage survival, outmigration run timing between hatchery and naturally produced smolts, outmigration run timing of the different stocks, and to compare the outmigration timing of different release locations and methods.

Coded-Wire-Tags

Salmon and steelhead encountered at traps, as well as fish encountered during creel surveys will be examined for fin clips (mark sampling) and CWTs. Lengths, sex, and scales will be randomly (biological sampling) taken from adult salmonids encountered at trapping facilities. Coded-wire-

tags and scale samples recovered from hatchery operations and during creel surveys will be analyzed at the WDFW Olympia office. Coded-wire-tag analysis provides insight to stray rates of hatchery and native salmonid stocks, life history changes, and spawner to spawner survival rates.

Genetic and morphometric sampling

Tissue and scale samples will be collected from fish handled during monitoring programs (trapping facilities, carcass surveys, and/or creel surveys). Genetic analysis will be conducted on the samples (allozyme or DNA-based sampling) to determine the degree that discrete populations persist in individual watersheds. Allozyme collections will be compared with past collections to monitor changes in allelic characteristics, and with the intent to assess whether supplementation programs negatively affect the genetic diversity of the natural populations.

Scale samples and morphometric data may also be collected from fish handled as a result of monitoring programs. These data will provide information on fish age, sex, size, time of return, and fecundity. This information will be used for future management decisions.

Using a combination of many of the survey and sampling activities listed above, spawner to spawner survival rates are estimated for spring chinook in the Tucannon River and will be estimated for steelhead in this river in the future. Spawning and redd surveys, trap counts, and carcass surveys provide the data needed to estimate the number of returning adults annually. Recovery of coded-wire-tags reveal the origin and age of the returning adults. Trap counts and carcass surveys provide hatchery- to native-origin spawner ratios. Morphometric data sampling provides a means to estimate the number of eggs that would be put into the gravel annually by natural spawners. Snorkel surveys provide data on parr abundance and age to estimate the ratio of 1+ juveniles that may overwinter in the river. Additionally, the downstream juvenile salmonid trapping facility collect data used to estimate the number of juvenile salmonids migrating from the Tucannon River system.

Fisheries monitoring

Performance indicators for fisheries typically include estimates for the catch, catch rate, harvest, harvest rate, hooking mortality for fish caught and released, effort of the fishery, and catch per unit effort (CPUE) for the fishery. Washington Department of Fish and Wildlife makes statistically based estimates of hatchery-origin salmon and steelhead catch from the WDFW catch record card (CRC) and follow-up phone surveys. Indirect mortality that can occur from wild salmon and steelhead release is monitored by WDFW. Based on literature searches, WDFW estimated the hooking mortality for steelhead (Rawding 1998), and salmon to be approximately 5% (Bendock and Alexandersdottir 1993, and Schroeder et al. 1999). Creel surveys are conducted on the Snake, Tucannon, and Grande Ronde rivers for salmon and steelhead to assess hatchery programs. Creel surveys provide a means to collect coded-wire-tags from salmon and steelhead, and provide inseason catch rates for salmon and steelhead. In conjunction with CRC estimates, creel surveys can be used to determine the hatchery harvest rate, interception rate for wild fish, and catch per unit effort (CPUE).

3.2) Description of other monitoring and evaluation not included in the Performance Indicators (section 3.1) which provides additional information useful for fisheries management.

In addition to routine monitoring and evaluation activities described in Section 3.1, WDFW also collects or uses information from other sources related to the status of listed salmon and steelhead and the implementation of fisheries which might affect them. Since freshwater habitat is linked to wild salmon and steelhead production, WDFW monitors habitat through the Salmon and Steelhead Habitat Inventory and Assessment Program (SSHIAP) and through checks on hydraulic permits. These data may be useful in forecasting salmon and steelhead runs, because they may quantify changes in habitat productivity, such as habitat improvement projects that open historic habitats or document natural compensatory processes. Finally, extensive monitoring and evaluation is conducted for chinook salmon and steelhead at local hatcheries. These programs inventory production and returns, tracks straying, monitors fish health, and evaluates return rates to hatchery facilities, as described in individual Hatchery and Genetic Management Plans.

Oregon Department of Fish and Wildlife operates a smolt trapping facility at Rkm 1.9 on the Grande Ronde River. The objectives of this program is to provide information on travel time, migration timing, and survival of smolts through hydroelectric projects along the migration corridor. PIT tagging studies are conducted for hatchery and wild origin chinook and steelhead caught at this facility. Information collected from these studies is used by fish managers to determine optimal release timing for hatchery smolts and to schedule fisheries to provide the most protection to outmigrating smolts.

3.3) Public Outreach

The popularity of the salmon and steelhead fisheries result in intense public interest and participation in the annual management processes for these species. Washington Department of Fish and Wildlife conducts extensive public involvement and outreach activities related to salmon and steelhead fishery management and recovery. The annual fishery regulation process involving a series of public meetings, information mailouts, press releases, and public hearings was described in detail in section 1.5. Anglers are keenly aware of, and accustomed to, abrupt inseason management changes including closures and reopenings with short notice. Permanent regulations are detailed in published pamphlets of fishing regulations. Annual regulation and inseason changes are widely publicized with press releases, phone calls or faxes of action notices to key constituents, and signs posted at fishery access points. Washington Department of Fish and Wildlife also operates an information line, a recorded hotline, and an Internet web page where timely information is available.

3.4) Enforcement

Sport fishing regulations in Washington are enforced by the Enforcement Program of the WDFW. The Fish Management and Enforcement programs work together to develop enforceable

regulations to achieve fish and wildlife resource management goals. Enforcement and Fish Program staff work together to facilitate enforcement of resource management goals through a cooperative enforcement planning process where local sergeants and officers meet with local biologists at the district level to set enforcement priorities for each fish species. Sergeants then develop plans to address priority issues and to attain desired compliance levels to protect resources and meet management goals. Compliance is typically estimated based on the percentage of angler contacts where no violations are noted. The plans are adjusted, if necessary, based on compliance assessments to make the best use of limited resources in manpower and equipment to achieve the goals.

Fisheries are assigned a high priority for enforcement and are intensively monitored. Officers are assigned to work during open fishing days and restricted periods, and with additional checks during closed periods. Officers conduct bank and boat patrols to check and assist anglers. Covert surveillance is also made in locations where complaints on violators have been received.

Washington Department of Fish and Wildlife enforcement staff conducted a statewide angler compliance survey in 1992 and 1993 in waters that were open to fishing under wild steelhead release or catch and release regulations. A total of 4,879 anglers was contacted. The anglers had retained 351 steelhead. A total of six wild steelhead was retained, providing a compliance estimate of 98.3% (Hahn 1994).

3.5) Schedule and process for reviewing and modifying fisheries management.

A review of the fisheries will be conducted annually. An assessment of the overall effectiveness of the FMEP will be conducted approximately every five years. Any new information will be taken into account, and used to revise assumptions or management strategies as needed.

3.5.1) Description of the process and schedule that will be used on a regular basis (e.g. annually) to evaluate the fisheries, and revise management assumptions and targets if necessary.

Wild population status and fishery performance will be assessed annually by WDFW. The annual fishery review process described in detail in Section 1.5 will continue to be employed to evaluate fisheries and revise management assumptions and targets as needed. To ensure that fish population and fishery management is meeting the goals described in this plan, annual monitoring will include wild fish escapement numbers and/or indices, cohort replacement rates, projected future wild and hatchery numbers based on age composition of recent returns, fishery harvest of hatchery fish and handle of wild fish, fishery effort, fishery catch per unit effort, mark rates in the fishery and escapement areas, and projected fishery impacts on wild fish.

Critical and viable thresholds for each population have not yet been established at this time. Over the next year, WDFW will work with TRTs to develop estimates of critical and viable thresholds and incorporate these thresholds into this fishery analysis.

3.5.2) Description of the process and schedule that will occur every five years to evaluate whether the FMEP is accomplishing the stated objectives. The conditions under which revisions to the FMEP will be made and how the revisions will likely be accomplished should be included.

The mean age of maturation for most salmon and steelhead population is five years and it makes little sense to evaluate this FMEP sooner than that period of time. Therefore, comprehensive reviews will be repeated by WDFW at five-year intervals thereafter until such time as the wild stocks are recovered and delisted. Consultations between WDFW and NMFS regarding management of these fisheries will be reinitiated only if there are significant changes in the status of listed chinook, sockeye, or steelhead populations or their habitat, or significant need for modifications to fishery management objectives and implementation.

**SECTION 4. CONSISTENCY OF FMEP WITH PLANS AND CONDITIONS SET
WITHIN ANY FEDERAL COURT PROCEEDINGS**

Treaty tribes co-manage fish resources with WDFW, including setting harvest limits and seasons.
See 1.1.3

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